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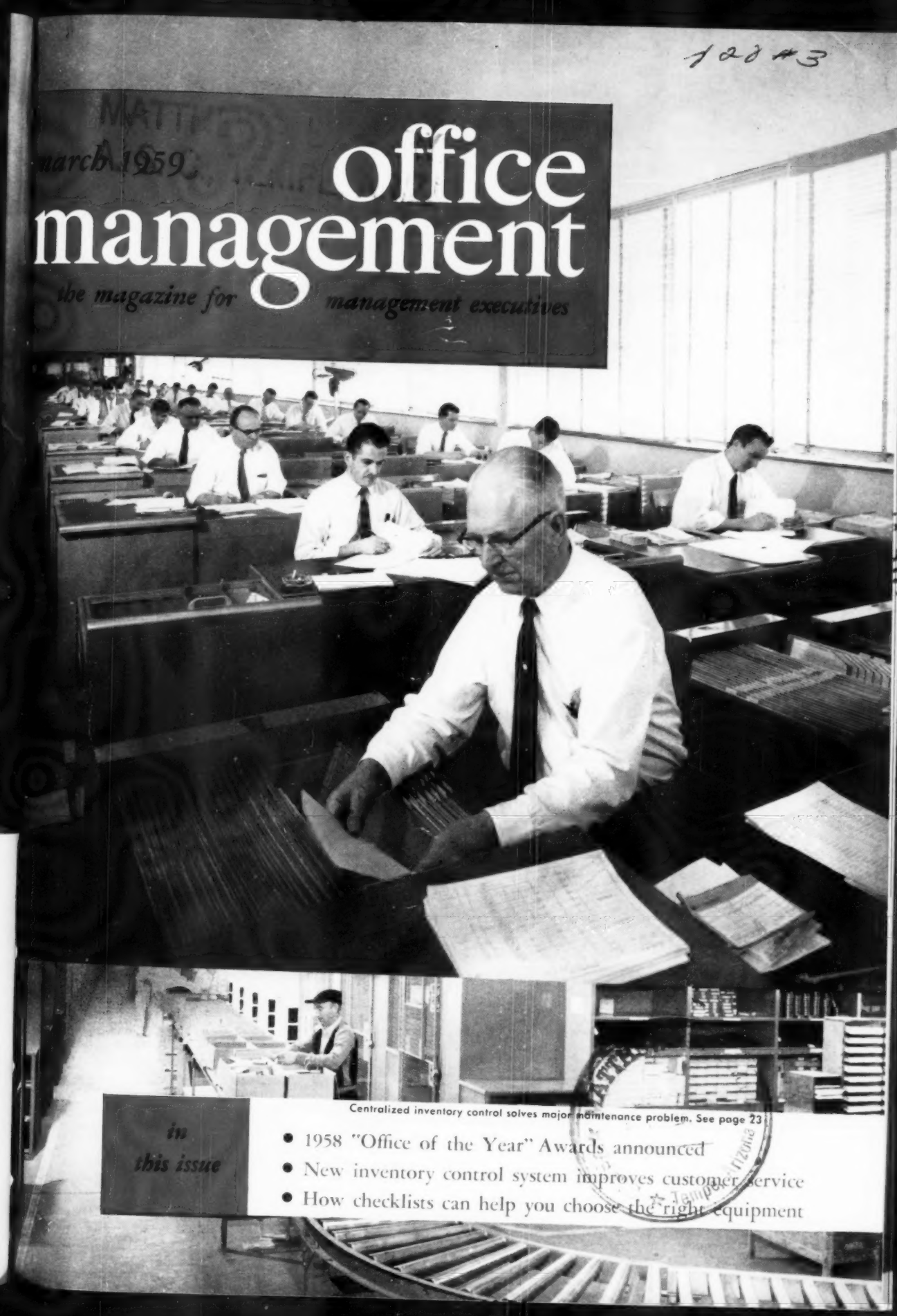
March 1959

office management

the magazine for management executives



Centralized inventory control solves major maintenance problem. See page 23

in this issue

- 1958 "Office of the Year" Awards announced
- New inventory control system improves customer service
- How checklists can help you choose the right equipment

OFFICES OF The Kansas Power & Light Company, Topeka, Kansas.

H. F. SCHUSTER, Supervisor Machine Accounting.

EMPLOYEES find Nationals extremely easy to operate.

"Our *National* System

saves us $25,000 a year...

returns more than 76% annually on investment."

—The Kansas Power & Light Company, *Topeka, Kansas*

"Our new National System has produced savings far greater than we had anticipated," writes H. F. Schuster, Supervisor of Machine Accounting for The Kansas Power & Light Company. "Since installing National wired adding machines and punched tape recorders in sixteen of our principal offices, we have reduced labor costs, cut accounting time, postage and paper costs, and greatly reduced errors.

"The accuracy-insuring features of our National System enable us to reduce reported billing errors to an average of only six per month in billing over 220,000 customers and making more than 285,000 calculations. With the National punched tape, manual key-punching and verification of cards are eliminated—resulting in time and money savings of approximately $20,000 a year.

"We have also found that mailing the lightweight NCR punched paper tapes from our branch offices to the main office (instead of the previous heavy transmittal cards) saves us approximately $5,000 annually in postage.

"We figure our National System saves us at least $25,000 a year . . . returns more than 76% annually on our investment."

Supervisor of Machine Accounting for The Kansas Power & Light Company

Your business, too, can enjoy the increased efficiency and economy made possible by a National System. Nationals pay for themselves quickly through savings, then continue to return a regular yearly profit. National's world-wide service organization will protect this profit. Ask us about the National Maintenance Plan. (See the yellow pages of your phone book.)

*TRADE MARK REG. U. S. PAT. OFF.

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ACCOUNTING MACHINES
NCR PAPER (NO CARBON REQUIRED)

THE NATIONAL CASH REGISTER COMPANY, Dayton 9, Ohio

1039 OFFICES IN 121 COUNTRIES • 75 YEARS OF HELPING BUSINESS SAVE MONEY

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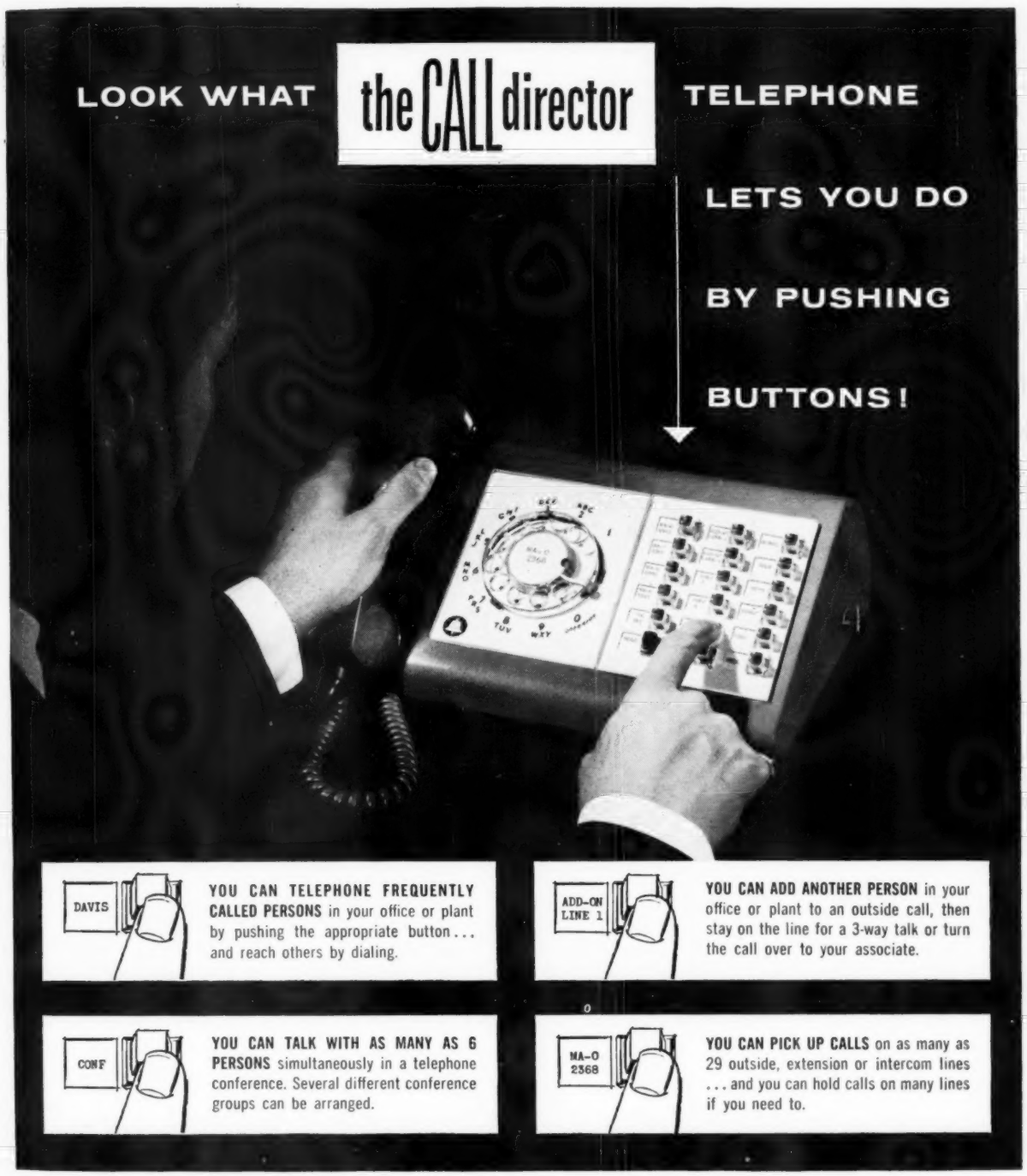
LOOK WHAT **the CALL director** TELEPHONE LETS YOU DO BY PUSHING BUTTONS!



YOU CAN TELEPHONE FREQUENTLY CALLED PERSONS in your office or plant by pushing the appropriate button... and reach others by dialing.

YOU CAN ADD ANOTHER PERSON in your office or plant to an outside call, then stay on the line for a 3-way talk or turn the call over to your associate.

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Brand D
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YES NO NO NO NO
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YES NO NO NO NO
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YES NO NO NO NO
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YES NO NO YES NO
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YES NO NO NO NO
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YES NO YES NO NO
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YES NO NO YES YES
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Smith-Corona Electric

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MARCH 1959

Volume XX No. 3

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Published Monthly by
GEYER-McALLISTER PUBLICATIONS
Andrew Geyer-McAllister, Inc., Est. 1877
212 Fifth Ave., New York 10, N. Y.
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office management

Office Methods, Equipment, Personnel, and Purchasing
Sponsor of the "Office of the Year" Awards

in this issue:

New centralized inventory control plan speeds Massey-Ferguson customer service 23
by Robert M. Smith

How checklists can help you select the best office equipment for your company 26
by John LeRoux

"Office of the Year" Awards are announced 29

Machines can aid the decision-making process—within these strict limits 30
by Raymond Dreyfack

AMA conference will stress role of computers in "dynamic management" 32

American systems approach brings peaceful revolution to Brazilian bank 33

Automation in the office 34

Tape punching accounting machines simplify drug company's accounts payable operation 35

Tools of the office series 38
This month: Copying and duplicating machines

Office building boom continues (*Editorial*) 104

EIGHTY-FIVE thousand parts—and any one of them may be essential to some entrepreneur's financial future. How one manufacturer has insured that his customers will never be penalized by a machine breakdown that cannot be readily repaired is the subject of the story on page 23.

Subscription: $4 a year in United States and in possessions, Canada, Mexico and Cuba. Other countries $9 a year. Single copies 45c: Yearbook Issue $1. Copyright 1959 by Andrew Geyer-McAllister, Inc.; all rights reserved. Also publisher of Geyer's Dealer Topics, Who Makes It and Where, and The Gift and Art Buyer. Please give 60 days' notification of any change of your address. Re-entered as second class matter June 29, 1953, at the Post Office at New York, N. Y., under Act of March 3, 1879.

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Pitney-Bowes signs consent decree; will aid competitors

Under terms of a recent consent decree by which Pitney-Bowes, Inc., Stamford, Conn., and the Department of Justice settled the department's proposed anti-monopoly civil suit against the Connecticut concern, Pitney-Bowes will give any appropriate concern qualified by the Post Office Department a license to use its postage meter patents.

In a statement following the consent decree, which contained a denial by the company of the complaint's allegations, Walter H. Wheeler, president of Pitney-Bowes, said that the company had "long recognized the need of, and wanted, competition. If it had been necessary," he continued, Pitney-Bowes "could have shown in court that its pre-eminence in the postage meter field had been attained solely on merit of product and service, and not through any violation of the antitrust laws.

"We are glad we were able to reach a reasonable agreement settling the proposed civil suit," Wheeler said in his statement, "and enabling us to take steps to help restore competition in the postage meter industry. We are confident that we could have shown in court that our pre-eminence in this field has been attained solely on merit of product and service and not through any violation of the antitrust laws, but we have always recognized that competition is as much in our own long range self-interest as it is in the public interest.

"We offered, in fact, to assist our only active competitor some eight years ago when it started to let its postage meter business lapse in favor of other products, but it did not pursue the matter on the advice of legal counsel that such help itself might be held to be in violation of the antitrust laws. This competitor, a combination of three other companies which had competed with us, has for some time been designing a new line of postage meter equipment and plans actively to reenter the field. We also understand that a fourth company, which had competed with us before the last war, has now had a more modern meter approved by the Post Office Department.

"The main provisions of the decree, which will be published and available to anyone interested, provide for us giving any appropriate concern qualified by the Post Office Department, a

From first quarter to last:

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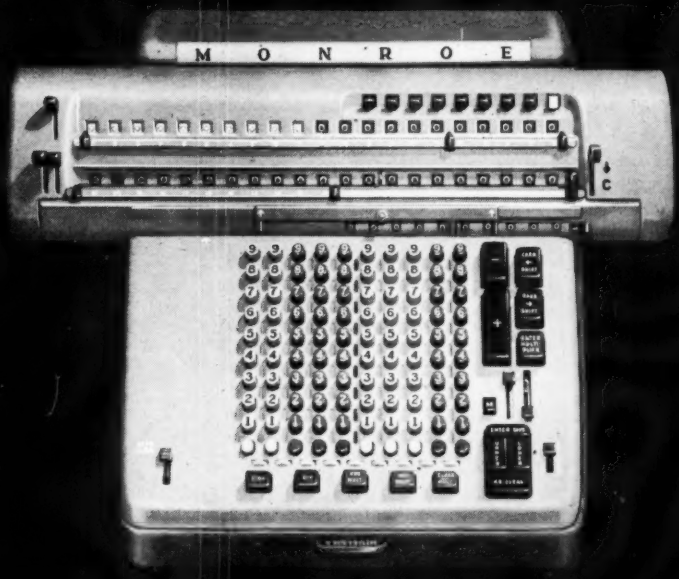

In the world of business figures, the rewards come to those who find the most profit-making minutes in each month.

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royalty-free license to use any of our existing postage meter patents and applications, a license at a reasonable royalty to use our postage meter patents resulting from applications filed within the next five years, and certain technical information related to our present manufacturing and servicing operations. The concerns referred to above are, of course, already qualified by the Post Office, and this help from us, which we anticipate their seeking, should accelerate their re-entry into the field.

"Renewed postage meter competition will also help to maintain the morale, efficiency and interest of our employees, all of whom share in our profits, and a large number of whom have become, or are becoming, stockholders as well, through our Employee Stock Purchase Plan. Paradoxically, this exceptional employee loyalty and interest Pitney-Bowes has enjoyed has probably been, and will continue to be, the most important factor rendering Pitney-Bowes difficult to compete with."

IBM reports serious '58 drop in electronic computer sales

Business purchases of new punched card and electronic data processing equipment were sharply affected by last year's recession, Thomas J. Watson, president of International Business Machines, revealed at a recent press conference in San Francisco. New orders for these products, the largest part of the IBM line, for the first three quarters of 1958 amounted to only 40 per cent of sales during the corresponding period in 1957.

Although sales improved during the last three months of the year, Watson reported, the total sales for the year amounted to only 50 per cent of the previous year's sales in these two categories of equipment.

Paradoxically IBM's earnings increased during 1958, according to Watson, but the rise in income represented payment for delivery of equipment ordered before 1958, and rental income for equipment installed before last year.

"The fact is," he said, "that IBM derives a substantial portion of its revenues from rentals paid to us for our equipment and services. Thus a large part of our current revenues comes from the sale and installation of equipment during past years.

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"Second, the lead time between a sale and the actual installation of our equipment normally ranges from six months to two years. We had a good backlog of unfilled orders. Therefore, we were able to sustain production and installation of equipment by shipping against that backlog."

Mr. Watson said that "while there are definite reasons for caution to temper the general optimism about national business prospects for 1959, we in IBM have confidence in the future."

Costs of fraud twice those of fire damage, auditors told

American business will lose more than twice as much through fraud during 1959 as it will through fire, William Klotz, Sales Training Director, Cummins-Chicago Corp., predicted in a recent speech before the Institute of Internal Auditors.

Losses through fraud will amount to more than one and one-half billion dollars during the coming year, he said —representing approximately 3½ per cent of corporate profits for the year.

Moreover, he continued, annual losses due to fraud are an increasing problem, since both the number of cases and the average losses per case are increasing yearly.

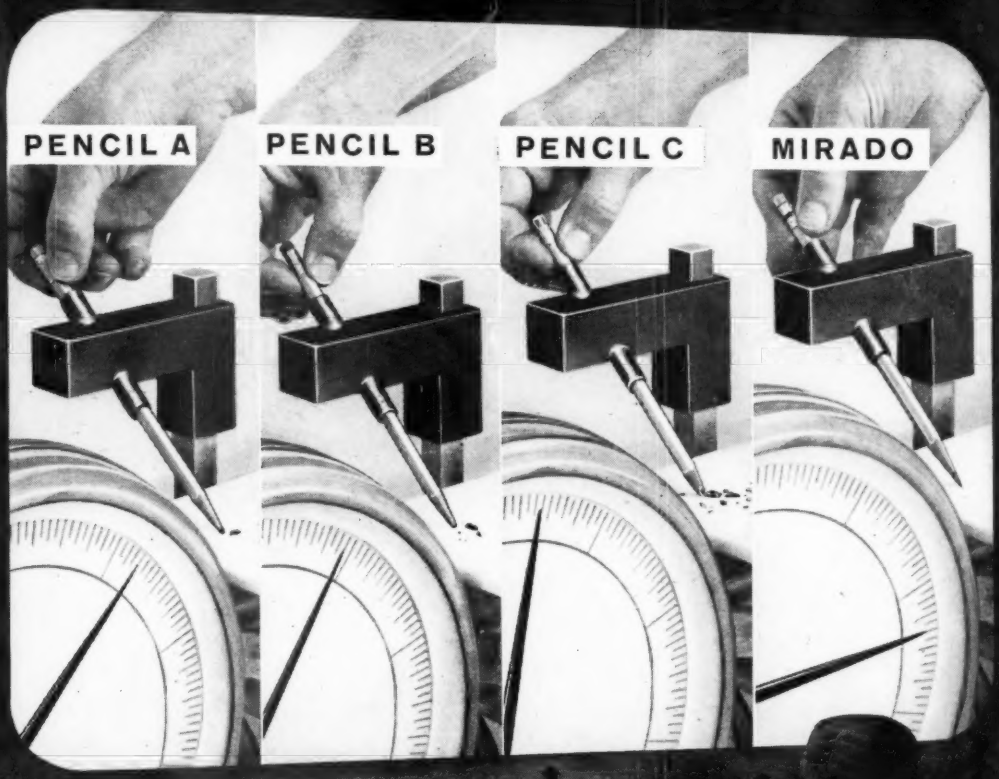
Klotz estimated that about a million businessmen per year are victimized by embezzlers, and that, in the majority of cases, the people perpetrating the fraud are trusted employees who have been with their employers for a number of years.

"This is particularly logical," he pointed out, "when one considers that an embezzlement can only be committed by a person in a position of trust."

Embezzlements to pay hospital and medical expenses of members of the employee's family are becoming increasingly frequent, he reported.

"Management, whose basic responsibility is safeguarding company assets, is directly and morally responsible for devising ways and means to reduce opportunities for employees to defraud," Klotz asserted. He further emphasized that management should insure that an adequate internal control system is established, and should be constantly on the alert to see that the system continues to function as effectively as designed.

"Management today is constantly reviewing new machine procedures



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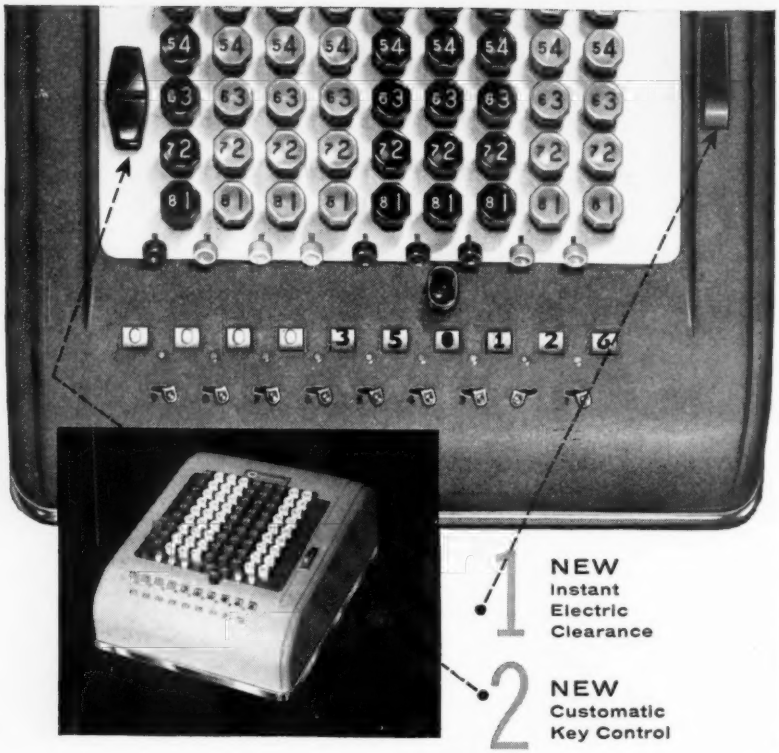

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with a view to reducing clerical costs," he went on. "Too often, though, new mechanized systems are adopted without consideration of fraud control. The danger here is accepting answers given by computing machines without investigating the information fed into them by human beings. Although it has been said that machines will not yield to corruption and temptation, it must not be forgotten that machines process data prepared by human beings, and are operated by human beings. And human beings will never be immune from temptation."

Research budgets rose slightly in '58, AMA reports

Research budgets in American industry, which in 1958 ran about 4 per cent ahead of the previous year, will be increased still further this year, Dr. Philip Marvin, manager of the American Management Association's research and development division, told executives attending a recent AMA seminar in New York.

An AMA survey of more than 800 companies throughout the country early in 1958, Dr. Marvin stated, revealed that 1958 budgeted expenditures for research and development were, on the average, 4 per cent higher than 1957 expenditures. Dr. Marvin said that a later sampling of approximately 15 per cent of this group uncovered plans for increasing research budgets this year by more than 6 per cent over 1958.

Dr. Marvin explained that the executives of the companies consulted felt that "today's investment in tomorrow" is the basic ingredient in forward planning. Today's leaders, he reported, are aligning growth guides to opportunities inherent in the foreseeable future. Rather than contemplate "normal" growth rates of, say, 10 per cent a year, corporations look ahead, through basic research programs, to growth rates as high as 30 to 60 per cent.

This is the reason, Dr. Marvin declared, that companies are paying more attention to research on broad fronts —research in basic sciences, engineering technology, production techniques, demand patterns, distribution methods, and administrative procedures. Not only are corporations upping their budgets for present research programs; they also intend to expand the scope of their research, he stated.

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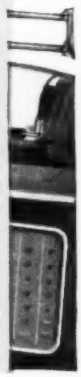

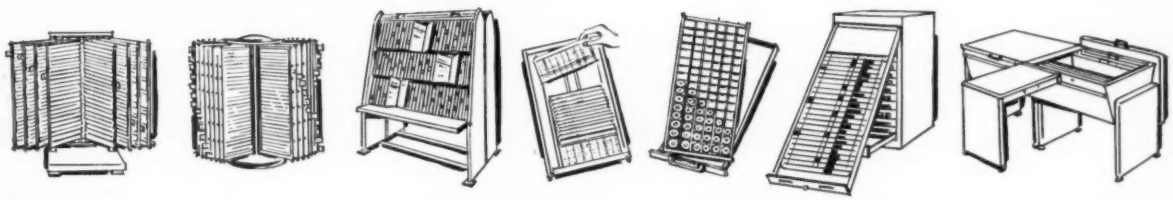

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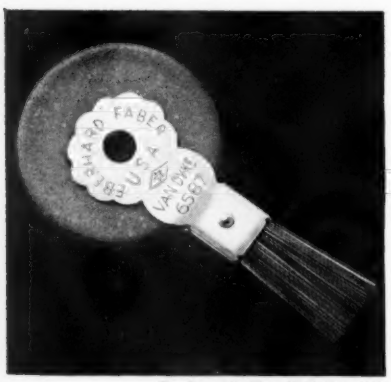

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In Short—

New office equipment "package" lease plan offered by Chicago company

A new package lease plan, under which any combination of office equipment may be grouped as one "package" and leased as a unit for three to five years, was announced last month by Nationwide Leasing Co., Chicago.

According to the company's president, Robert Sheridan, the package plan offers a method by which either large or small firms may acquire $10,000, $25,000, $50,000 or more in equipment without heavy capital investment.

Under the lease arrangements offered by Nationwide, a company could lease $10,000 worth of equipment for three years for a monthly payment of $320. The $25,000 package lease would cost $800 monthly for three years, $625 monthly for four years. A $50,000 package lease is offered under three-year, four-year, and five-year terms. Three-year leases would cost $1,600 monthly; four-year plans, $1,250; and five-year leases, $1,050.

New York headquarters for 13 per cent of nation's largest companies

Thirteen per cent of U. S. businesses with an indicated worth of one million dollars or more have their headquarters in New York State, according to the new "Million Dollar Directory" recently issued by Dun and Bradstreet. There are 20,847 businesses listed, and, of these, 2,750 have their main offices in New York.

The next five top ranking states in terms of number of million dollar concerns are: Illinois, Texas, Pennsylvania, Ohio, and California, in that order.

The newest state, Alaska, has the smallest number of million dollar concerns—ten.

Webster Electric buys Telecom—will operate it as subsidiary

The Webster Electric Co., Racine, Wis., recently purchased Telecom, Inc., of Kansas City, in a move to expand its line of intercommunications equipment. Telecom will operate as a wholly owned subsidiary of Webster, and will continue to manufacture its products in Kansas City. John Van Horn, former president of Telecom, will continue with the company as resident manager in charge of the Kansas City operation. R. O. Rheaume, former Telecom sales manager and vice president, will handle Telecom sales duties from Webster's offices in Racine.

Addressograph-Multigraph establishes subsidiary Danish company

Addressograph-Multigraph Corp. has announced the establishment of a wholly owned subsidiary company in Copenhagen, Addressograph-Multigraph A/S. The new organization, which is the American company's eleventh foreign subsidiary, will be responsible for all Addressograph, Multigraph, and Vari-Typer distribution and customer service operations throughout Denmark.

Books and Pamphlets

HOW TO COMBINE THE TAX ADVANTAGES OF BOTH CORPORATIONS AND PARTNERSHIPS FOR YOUR BUSINESS, prepared by Tax Research, Inc., a division of Research Institute of America. Random House, Inc., 457 Madison Ave., New York 22. $12.

Methods of achieving tax savings under recent legislation which makes "pseudo corporations" possible are described in this book. According to the book, companies may now earn the legal and tax benefits of a corporation without the double tax, first on corporation profits, and then on stockholders' income. The book analyzes the legislation in terms of specific situations in which important tax savings can be realized.

ELECTRONICS IN BUSINESS, by Gardner M. Jones, 106 pages. Bureau of Business and Economic Research, College of Business and Public Service, Michigan State University, East Lansing, Mich.

While emphasizing electronic applications in the accounting field, this book also analyzes some of the broad problems involved in planning and successfully conducting an electronics installation.

LINEAR PROGRAMMING — METHODS AND APPLICATIONS, by Saul I. Gass. 223 pages. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $6.50.

The book reviews the basic fundamentals of linear programming, and then explores some of the more sophis-

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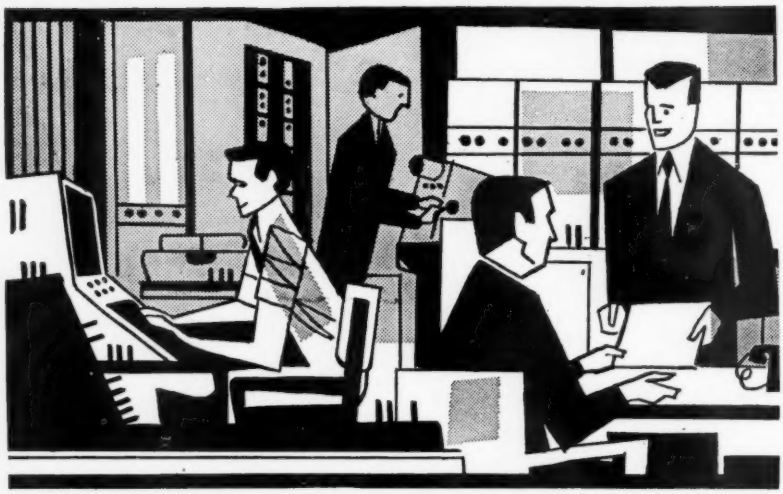

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AUTOMATION IN THE OFFICE

Since the appearance of the first discussion on the subject of Automation in the Office in the August issue of 1952, OFFICE MANAGEMENT has published articles on Automation on a regular basis to keep the office abreast of everything new on this modern technique. Here are some typical ones:

JANUARY, 1958
How to prepare an office for a computer installation
FEBRUARY, 1958
Basic steps in programming a computer for a single operation
by Ben Conway
JUNE, 1958
Why small companies may need automation even more than larger concerns
by Robert M. Smith
JULY 1958
Why small companies need automation even more than larger concerns
Part 2 Equipment for "Automation in the Office"
AUGUST 1958
Why small companies need automation even more than larger concerns. (Conclusion)
SEPTEMBER 1958
The role of automation in freeing managers for more creative work.
OCTOBER 1958
Why new computer coding techniques may accelerate pace of office automation — by Robert M. Smith
JANUARY 1959 (Yearbook Issue)
Effects of recession still felt in current trends in automation
by Robert M. Smith

WHAT IS AUTOMATION IN THE OFFICE?

Automation in the office is the use of the rapidly multiplying new systems developments and facilities of electronics to synchronize the functions of separate units of equipment into an overall operation. Importantly, while it can and does employ the latest in electronic computers and other new devices, it does not necessarily call for costly or experimental type of machines and equipment. Equipment presently in use in every modern office in America can be geared in one way or another to Automation.
As new progress is achieved and case histories are reported, OFFICE MANAGEMENT will carry the great story forward.

OFFICE MANAGEMENT

The Magazine for Management Executives
212 Fifth Avenue New York 10, N. Y.
A Geyer-McAllister Publication

ticated mathematical techniques that can be applied in business and industry. The final section of the book covers types of applications—transportation problems, production scheduling and inventory control, for instance—in which linear programming has proved valuable.

THE UNCOMMON MAN—THE INDIVIDUAL IN THE ORGANIZATION, by Crawford H. Greenewalt. 160 pages. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. $4.

Written by the president of E. I. duPont de Nemours & Co., this book is a spirited defense of "non-conformism" in business life, and an appeal for the establishment of maximum freedom and incentives for all personnel within a company. The author describes the compensation system and "hands off" management policy at duPont, and offers his ideas on such a wide range of subjects as executive training and evaluation; political science; effects of tax policies on the individual, and on the corporation; and executive selection. Mr. Greenewalt's book is the third volume in the McKinsey Foundation Lecture Series, which is sponsored by the Graduate School of Business at Columbia University.

HOW 300 COMPANIES HANDLE CONTRIBUTIONS, prepared and published by The Dartnell Corp., 4460 Ravenswood Ave., Chicago 40. 200 pages. $15.

This survey reviews the policies of 300 selected companies in regard to philanthropic contributions. The analysis covers such questions as the general level of corporate giving; the best manner of handling contributions; the organizations selected most often as recipients; the details of corporate foundations, scholarship plans, and other long range charitable programs.

ADVANCED ACCOUNTING PROBLEMS, by Irving J. Chaykin and Max Zimering. 562 pages. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $10.50.

Designed both as an up-to-date reference for accountants, and a guide to those preparing for CPA examinations, this book attempts to cover each of the major subjects in accounting theory and technique. Each topic is discussed first in terms of theory, against a background of related principles, and is then illustrated in terms of examples,

(*To page* 21)

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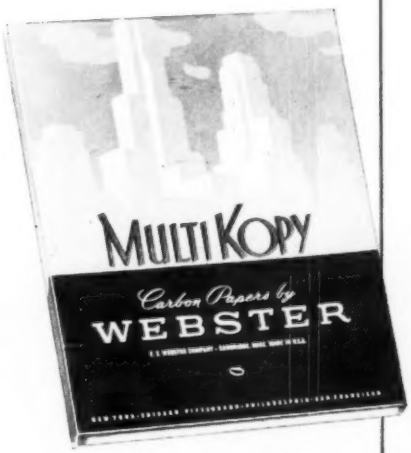

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John T. Farrell, Controller, and W. George Gardom, Supervisor of Mechanical Accounting—Rockwell Manufacturing Company.

How Teletype helps Rockwell speed service, increase work output

Rockwell Manufacturing Company, producer of meters, valves, regulators, control equipment and power tools, has many reasons for using Teletype equipment.

Major sales gain—no clerical increase. "In the five years since we installed Teletype equipment", says Rockwell's Controller, John T. Farrell, "our sales have jumped from 88 to 122 millions of dollars."

"In spite of an attendant 300 percent increase in the number of daily messages, the message center staff was not increased . . . still numbers two girls."

Report time cut. "Since the installation of Teletype equipment", says W. George Gardom, Supervisor of Mechanical Accounting, "numerous reports, such as monthly accounting reports from plants, are transmitted to headquarters by wire."

"This enables us to speedily 'deliver' monthly operating statements. The manual methods we used before took many days."

Teletype enables Rockwell:

1. To give faster, more direct, more efficient service to customers.

2. To handle a greater volume of material without increasing costs.

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4. To prepare messages in advance . . . transmit on schedule . . . leave Teletype machine unattended and still receive all incoming messages.

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Books and Pamphlets

(*From page* 16)

problems, and solutions. The latest terminology recommended by the American Institute of Certified Public Accountants is used, as well as the revised theories endorsed by that organization. Both authors are partners in CPA firms, as well as associate professors of accounting at the Bernard M. Baruch School of Business and Public Administration, at City College of New York.

APPRAISING EXECUTIVE PERFORMANCE, by Carl Heyel. 189 pages. The American Management Association, 1515 Broadway, New York 36. $4.50.

First in a series of AMA handbooks dealing with the basic skills and tools of management, Mr. Heyel's book essays to present information on how to set up realistic yardsticks for measuring an executive's performance, and how to judge specific managerial skills, including technical knowledge and experience, decision-making ability, and ability to coordinate and direct other personnel. Mr. Heyel also gives insight into the "right time" for evaluating executive performance, and into ways of relating the executive's personnel traits to his work—his attitudes, motives, and understanding of the job. Emphasizing appraisal in action, the author demonstrates how a planned appraisal interview aids a subordinate executive in reviewing his performance and developing his own abilities. Practical examples are drawn from actual company appraisal programs.

Coming Events

CIA Southern Regional Conference. New Orleans, March 5-7.
Sponsor: Controllers Institute of America.
Place: Roosevelt Hotel

ABA Installment Credit Conference. Chicago, March 9-11.
Sponsor: American Bankers Association.
Place: Conrad Hilton Hotel.

AMA Seminar: Reducing and Controlling the Costs of Office and Administrative Overhead. New York March 9-11.
Sponsor: American Management Association.
Place: Astor Hotel.

NAA Conference: Experience with Direct Costing. Cleveland, March 12-14.
Sponsor: National Association of Accountants.
Place: Hotel Statler.

Eighth Annual Systems and Procedures Conference. San Francisco, March 20.
Sponsor: University of California.
Place: Fairmont Hotel.

OMAC Seminar and Business Show. Chicago, March 23-26.
Sponsor: Office Management Association of Chicago.
Place: Conrad Hilton Hotel.

Conference: Human Factors in Supervision and Leadership. Berkeley, Calif., April (exact date not yet set).
Sponsor: University of California.
Place: Berkeley Campus.

NAA Regional Conference. Baltimore, Md., April 3-4.
Sponsor: National Association of Accountants.
Place: Lord Baltimore Hotel.

NOMA Annual Office Exposition and 40th International Conference, New Orleans, May 24-27.
Sponsor: National Office Management Association.
Place: Municipal Auditorium and Roosevelt Hotel.

with the EDITORS

RALPH Fairbanks, familiar to readers of this magazine for the last several years as the author of a wide range of stimulating and original articles on automation and systems planning, died suddenly last month at his home in Greenwich, Conn.

His death represents a very personal loss to the members of the staff of this magazine. For Ralph was more than a highly valued contributor. He was a colleague, serving as *Office Management's* technical consultant on office automation. His valued advice and guidance in this fast developing field have helped us to develop many of the articles which have proved most valuable to our readers in their own planning.

And most important of all — Ralph was a friend.

The author of "Successful Office Automation," regarded as one of the fundamental texts in this relatively new field, Ralph Fairbanks was one of the first systems planners to grasp the full implications of electronic devices for office work. His management consulting firm, Fairbanks Associates, Inc., was a pioneer in the introduction of automatic control and data processing elements to many small and medium sized companies.

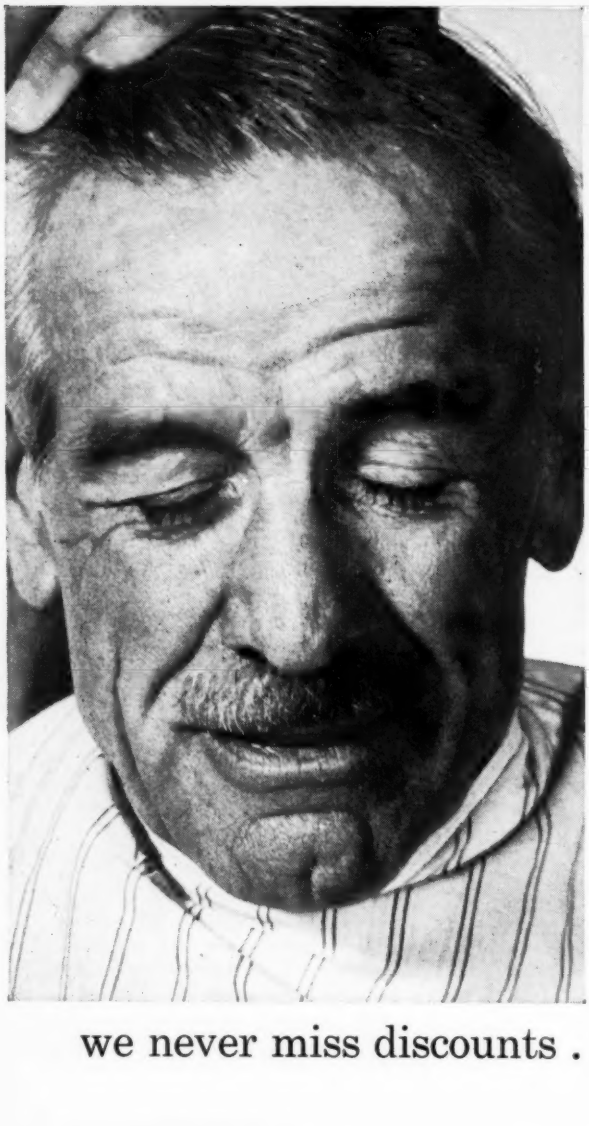
Before founding his own concern, Ralph had been associated with Ernst & Ernst as a systems planner. Fairbanks Associates, although it was only organized in 1952, has in the short span of seven years become one of the most respected and authoritative of management consulting groups.

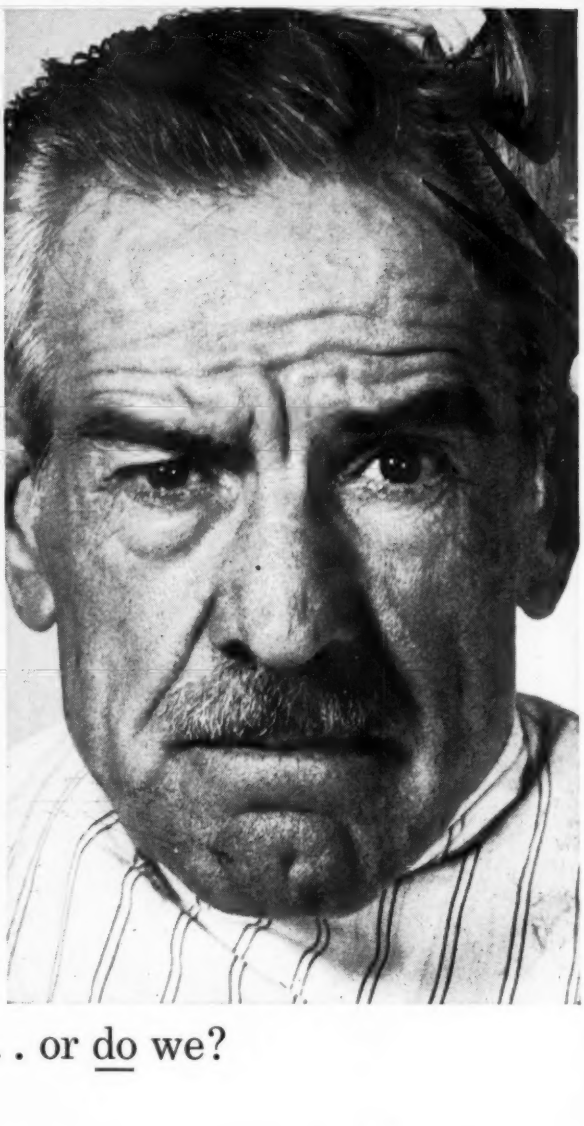
This has been no surprise to those of us who knew Ralph Fairbanks. It is what we would have expected. For whatever he did, he did well, with imagination, originality, enthusiasm, and a thorough knowledge of the principles and tools of his field. He brough to each assignment that rare combination of qualities—the ability to analyze, the ability to create.

But these were not his only attributes. Perhaps they were not even his most important ones. He had warmth and human understanding as well as technical ability in his profession; wherever he worked, he left firm friends behind. This, we think, is his greatest legacy.

It is in these terms that we shall remember him best. His accomplishments were many; his contributions, both to his field and to this magazine, substantial. But to us, Ralph will always be, first of all, a friend.

Robert M Smith
Editor





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MARCH 1959

office management

New centralized inventory control plan speeds Massey-Ferguson customer service

Farm equipment manufacturer insures quick replacement of any one of 85,000 parts used in its machines through central control over parts stocks in 47 branches—

by Robert M. Smith

IMPROVING service to customers by insuring that vitally needed mechanical equipment can be serviced quickly if a part should break or fail—

Relieving company branches of a major paperwork burden, and at the same time improving branch effectiveness in serving dealers—

Reducing warehouse space requirements and costs throughout all company facilities by maintaining inventories at levels that are always adequate, and yet never represent a heavy overstock—

These are the major improvements achieved by a new Centralized Inventory Control and Warehousing procedure recently inaugurated by Massey-Ferguson, Inc., major producer of agricultural equipment and machinery. One of the first such ventures in the agricultural equipment field, the completely revised inventory procedures of Massey-Ferguson promise a vast improvement in the company's ability to offer its customers, through its branch and dealer organization, quick replacement of any required part in any of its products.

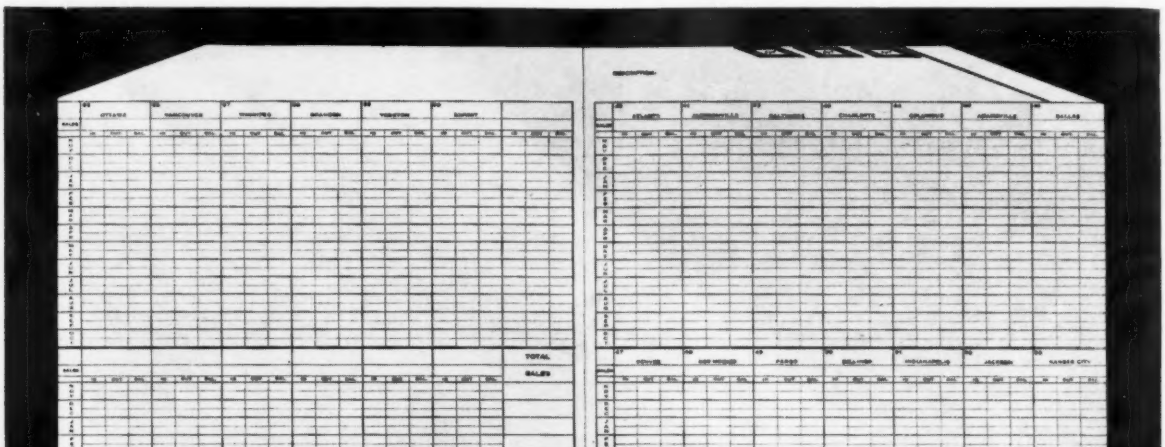
This ability represents a major competitive advantage in the farm equipment industry. Farm machinery constitutes the farmer's income-producing equipment; if it fails at the wrong time, and cannot be repaired quickly, his income suffers—and the company which sold him the equipment suffers the next time he buys machinery.

Thus, the ability to replace needed parts quickly is a vital service function for any manufacturer of farm machinery. But—it is also a major problem.

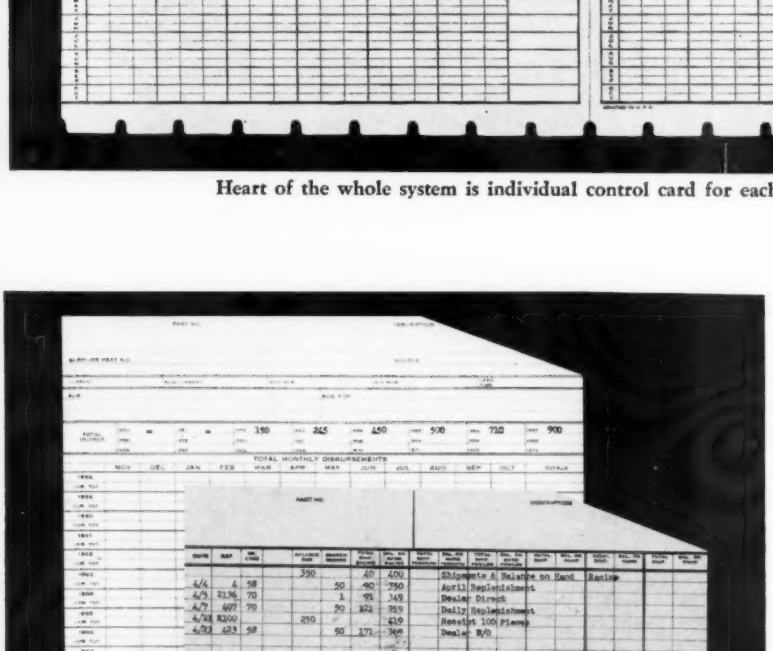
The problem stems from the multitude of different parts that must be stocked by a major manufacturer. Everyone is familiar with the necessity for a smoothly functioning supply organization in the automobile industry to insure that necessary replacement parts can be supplied quickly and easily for any standard car. With agricultural equipment the problem is more complicated because the range and variety of such equipment is much greater than is the case with an automobile manufacturer. The latter makes a limited number of models, in all of

Tabulating department creates punched card records for each parts shipment

Enormous number of different parts must be available through small branch and dealer network —



Heart of the whole system is individual control card for each one of 85,000 parts



Enclosed in control card are records for total stock of parts at Racine

which most parts are standardized. But every agricultural equipment firm makes a large number of entirely different types of machines, performing different functions, and requiring different parts.

So one phase of the inventory problem is quantity — Massey-Ferguson must be prepared to replace any one of more than 85,000 different parts used in its equipment, and do it in the shortest possible time from the moment the customer walks into his dealer and orders the new part.

But, still, to follow the analogy with the automobile industry, although a larger number of individual parts must be kept in stock, a smaller total number of products are made; there are more cars in this country than farms. So the branch and dealer organization is smaller in the agricultural equipment industry than it is in the automobile field, while the number of individual parts that must be readily available from each manufacturer is larger.

This is the basic problem that is attacked in the new inventory control procedures instituted by Massey-Ferguson.

This is their basic solution: centralized inventory control over all replacement parts for all machines made

by the company, and over the flow of such parts to the company's branches in this country and Canada. Centralized Inventory Control assumes all responsibility for maintaining stocks of parts at the desired levels in all of the company's 47 branches in North America. Each branch parts operation is responsible solely for reporting disbursements from its warehousing facilities to fill dealer orders for parts.

System completely changed

This is a complete reversal of the former system, in which parts supervisors in each of the company's 47 branches were responsible for determining and maintaining their own stock levels. Under this system, the parts manager at each branch would forecast twelve months in advance his anticipated yearly needs for each stock item, and order the quantity desired from whichever Massey-Ferguson parts warehouse stored it. If his forecast was wrong on any item, he could very well run out of the part before the year had ended. If, on the other hand, his forecast of sales for any given part was too optimistic, he would find himself loaded with a large quantity of parts which he could not move. His forecast had to be based on his records of the previous year's sales; since it had to be made for total needs over a twelve-month period, he could not take into account changing conditions which might affect the type of equipment used in his area, and therefore might also affect the demand for different parts. For instance, varying weather conditions and market prices might very well lead a farmer to put most of his acreage into soy beans one year, as compared with cotton the previous year. If most of the farmers in the area concentrated on soy beans, obviously cotton picking equipment would see little use, and there would be comparatively little demand for replacement parts for such equipment. On the other hand, heavier than normal demand would be made for parts for the machines used in soy bean farming.

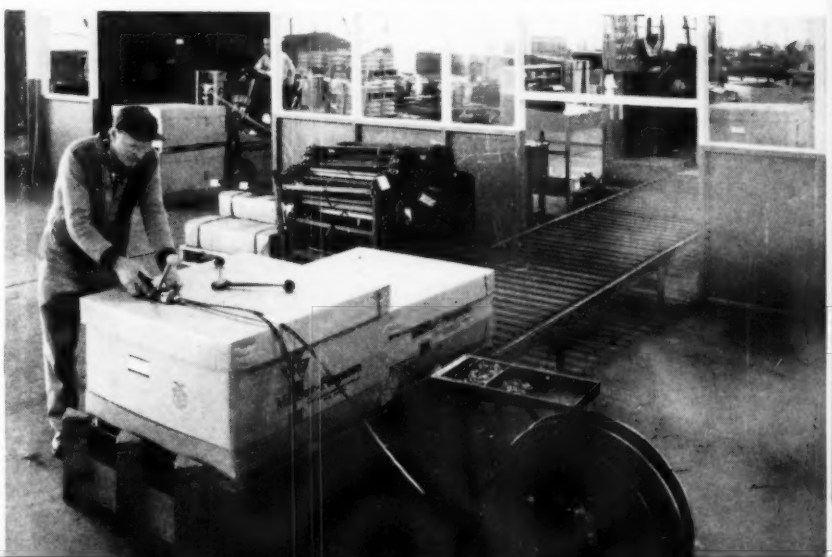
And so branch parts supervisors, having to forecast their parts needs such a long time in advance, were severely handicapped in anticipating changing requirements due to changing conditions.

By contrast, under its new centralized inventory control procedures, Massey-Ferguson can do more than

(*To page* 84)

Racine warehouse operations are also highly systematized; bins and rows are numbered in sequence, with each number corresponding to part designation —

Parts being readied for shipment move down gravity roller as they are packed



Checklist approach forces machine salesmen to stick to specifics in their sales efforts—

How checklists can help you select the best office equipment for your company

Comparing machine specifications, point-by-point, is less time-consuming than it appears, and gives a reliable basis for final choice —

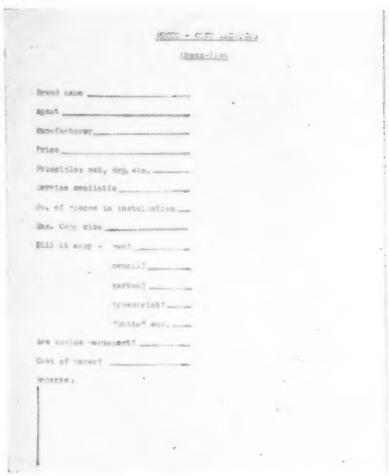
by John La Roux

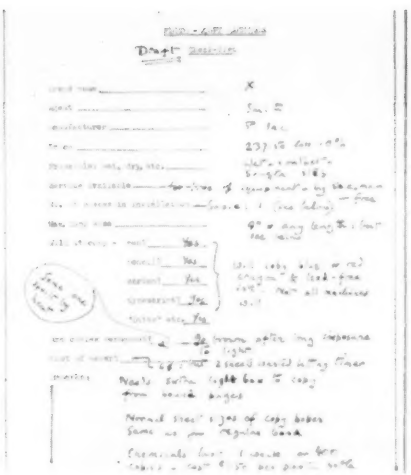
EQUIPMENT selection is a permanent headache for office managers. Several surveys have shown that it is one of the problems that causes them most concern.

As time goes on, it seems to get worse instead of better. There was a time when there seemed to be a reasonable hope that as one studied one machine after another, eventually one would come to the end of the list, and have a reasonable knowledge of most of them.

But that time is long past. These days, as fast as one gets to know something about one new machine, two more seem to come on the market—not to mention special new features added to the ones one used to know fairly well. Even a man who could spend all his time keeping himself up to date would probably have trouble; and how many firms can support that degree of specialization? Only the very largest.

There are two or three ways to try to cope with this problem. One could more or less give up, and resolve to stick with a few trusted salesmen who have supplied good machines for various jobs in the past, on the theory that there can't be so very much basic





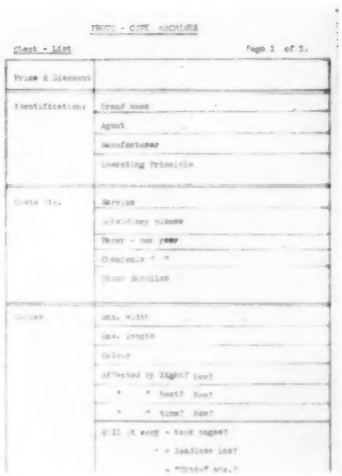


Fig. 1. (left) Original checklist is simple, covering first points that come to buyer's mind. Fig. 2. (center) First list will also give major machine capabilities for each product seen, as basis for comparison, and elimination of some machines. Fig. 3. (right) As more salesmen are seen, checklist becomes more elaborate, as shown here.

Selection of
COPYING MACHINE FOR STRETCHING DEPARTMENT

Summary of differences in makes

Price	$237.50	$245.00	$199.09
Brand name	X	Y	Z
Agent	Smith	Jones	Robinson
Manufacturer	P. Inc.	Q. Corp.	R. Inc.
Principle	Wet contact, single step.	Wet contact, Two steps.	Dry contact, Two steps.
Service	Life of eqpt., free.	1-yr. guarantee, $50 contract.	$4.00 hr. plus parts.
Expected paper usage	6,000	9,000	9,000
Paper cost	$600	$800	$950
Chemical cost	$150	$100	Nil
Copies per matrix	1	5	1

Fig. 4. Data obtained from checklists can be summarized on comparison sheet.

Selection of

COPYING MACHINE FOR STRETCHING DEPARTMENT

Evaluation of Time Differences:-

Brand or make	X	Y	Z
1. Operating Speed			
Actual output: Copies per minute:	1.8	1.3.	2.2
Expected copies per year	6,000	6,000	6,000
Total minutes	3,333	4,615	2,727
Cost @ $2 per hour	$111	$154	$91
2. Maintenance			
Cleaning: min. per week	30	30	15

SUMMARY OF TANGIBLE COST DIFFERENCES
(Annual)

Amortization: 5-yr. basis	$ 47	$ 49	$ 40
Paper	600	800	950
Chemicals	150	100	-
Other supplies	10	40	25
Operating time	111	154	91
Maintenance time	22	37	26
Expected down time & repairs	-	50	35
Total	$940	$1,230	$1,167

Fig. 5. Summary can be refined into comparison of time, cost figures.

difference between competitive makes in this highly competitive field. This is a gamble not many people would be prepared to take. What happens if one of the competitors complains to the big boss that he did not get a fair hearing, and it turns out that his product would have been quite a bit better for the particular application?

Another approach is to try to see all the vendors, form a good general impression of the various machines and devices, and rely on that. It works well for some people who have a talent for grasping mechanical principles and remembering a mass of detail. But what happens if the "expert" is away on a business trip, or sick? If a decision is needed urgently? Or, worse still, if he is moved (or moves) to another job?

Checklist saves time

Still another approach is to keep files and catalogs, and the most skeletal information on all the various gadgets that may be needed some day, and, when a specific need arises, call in salesmen for all the companies making the particular type of machine needed and see them all in a hurry. It works, but it plays hob with the schedule of other jobs every time one of these crises arises.

It was bitter experience with problems of these sorts that gave birth to the scheme that seems to be about the best answer so far. At first consideration it sounds rather laborious. Probably that is why so few people have tried it out.

But actually, most of the labor is involved in setting up the system. Once that is done the plan we advocate really pays dividends.

This answer, then, is the checklist approach. In principle it is simplicity itself. Establish checklists of the features of the various machines. A quick comparison will then give a ready means of selecting, absolutely objectively — or as nearly objectively as one could ever hope — the best one for the job.

"Good Lord!" anyone who has been involved with this problem may say. "It's bad enough to try to *see* all these machines. Checklists, now. You'd never get them finished."

The strange thing about it is, though, that making the checklist is actually often quicker than trying to find out about the same machine without any such object in mind.

(*To page* 95)

"Office of the Year" Awards are announced

FOR THE NINTH SUCCESSIVE YEAR, *Office Management* announces the winners of its annual "Office of the Year" Awards.

Selection is on the basis of outstanding achievement in design, layout, equipment, and general fitness for performance of the work which the office is called on to do.

Basis of the selection is a survey of opinion which *Office Management* takes among selected members of the American Institute of Architects and the Association of Consulting Managing Engineers whom *Office Management* considers to have a special interest in the office field. The Awards are made in two size classifications, with the top winner in each classification designated as "Office of the Year" in that classification. This honor is symbolized by a silver plaque. The two runners-up in each classification receive Awards of Merit, symbolized by bronze plaques.

Pictures and details of the six winning offices will be featured in the May issue of *Office Management*.

(Offices designed for 300 or more employees)

OFFICE OF THE YEAR AWARD

Seagram Distillers Co.
New York, N. Y.

AWARDS OF MERIT

Eastman Kodak Co.
Rochester, N. Y.

International Minerals & Chemical Corp.
Skokie, Ill.

(Offices designed for up to 300 employees)

OFFICE OF THE YEAR AWARD

Guarantee Mutual Life Co.
Omaha, Neb.

AWARDS OF MERIT

Kelley-Smith Co.
New York, N. Y.

Wachovia Bank and Trust Co.
Charlotte, N. C.

Machines can aid the decision-making process—within these strict limits

When decision involves tangible facts or figures, office machines can relieve both executives and clerical staff; when it's a human question, they're helpless —

by Raymond Dreyfack
Director, Tabulating Systems, Faberge Perfumes, Inc., New York

THE RUNNING of a business may be accurately described as a series of actions taken upon a series of decisions.

If a purchase order is received, for example, the order will be filled only after a decision has been reached to sell the account in question the merchandise he requests. Under varying circumstances this could involve a simple routine decision or a comparatively complex one.

If credit is a factor a credit man will have to decide whether the customer is a good risk. Will the order be filled in whole or in part? A sales department person may have to decide if this is the type of account it would benefit the company to service. Or, is too much being ordered, or too little?

Before a payroll can be met a decision must first be reached that every check issued will be paid to a bonafide employee. Within the payroll framework itself additional decisions will have to be made with regard to taxes, deductions, sick leave, vacation pay, etc., ad infinitum.

Virtually every employee in a company is involved at one time or other in the consideration and resolution of such transactions. Most of them require a minimum of thought and consequently will be made by lower echelon employees.

When we measure the worth, how-

The machine hasn't been made that can solve the problem of the worker who's too good to fire, but who is also dictatorial, short-tempered with others

When decision demands some logic, some pure intuition—will this particular woman's hat be popular?—machines can be helpful, even though executive must make final decision

ever, of personnel above the lower echelons we think in terms of decision-making potential. A clerical group leader, for example, will have to guide his group, make decisions for less experienced workers. As we advance another rung up the ladder to the supervisor we find the demands on him to decide, or plot courses of business action, more frequent and more involved. The higher we climb the more complex the problems, the graver the issues, the larger the sums of money involved.

The value of the group leader, supervisor or vice president is directly proportional to the wisdom he applies to the decisions he is obligated to make.

Since so much time, effort and thought is devoted to the making of decisions it is only logical to analyze this area in terms of cost. First, however, we must break down the different types of decision and see what we are working with.

Let's assume that Mary B. is a worker in the bookkeeping department. She is bossy and short-tempered. She works with four or five other women, and, as a result of Mary's temperament, turnover is unduly high in the department.

With each new flare-up Mary's supervisor finds himself faced with a serious problem. In spite of her disposition she is fast, accurate and conscientious in her work. She's also an old-time employee. What action should the supervisor take? A decision of some kind is obviously indicated. Should he fire her or have her transferred? Should he isolate her? Should he throw the whole problem in the lap of his superior?

Here the supervisor has a definite decision to make. A human decision.

Machines capable of routine decisions

An order is received by the billing department. Under billing terms freight will be charged to the customer on orders under fifty dollars. Another decision to be made. To charge freight costs or not. This will be a simple routine decision made with a minimum of thought. More important, it will be a decision based on figures.

Let's complicate the above situation. Freight now will be charged to all customers ordering less than fifty dollars worth of merchandise, *provided*: a) the customer is not a key account, b) the account is not located in a strategic sales area, c) merchandise ordered is not PM stock.

Here the decision is also routine. However, instead of one consideration we now have four. Our decision will now be based on conditions as well as dollar amount.

We are now seated in the plushly carpeted office of the Director of Sales & Research. This personable $30,000 a year executive is frowning thoughtfully over some charts, graphs and reports on his desk. Let's assume further that he's a millinery executive, and that, perched before him on his desk is a brand new spring item, a bright red chapeau. The problem: the selling price of this hat.

Now, here's a man with years of experience. He has a certain sales instinct regarding this hat which, to some degree, will influence his decision. He also needs at his fingertips figures analyzing the past sales of similar items, items comparable in cost, design, appearance, fashion appeal. He needs reports analyzing business in general and the millinery business in particular. He also has a wife who loves to shop and he pictures himself in her position. How much would she pay for this hat if it appealed to her?

Obviously there are many factors involved, each of which must be considered before the ultimate price decision can be made. Some of the factors are based on figures and statistics; others on instinct, know-how and psychology. Primarily, however, the decision is one of judgment, experience, business know-how.

How, you may ask, can management save money on the making of decisions? The act of deciding involves thought, however small. Can we make people think faster and more efficiently? Possibly, in some cases, to a small degree. Can we exclude extraneous thoughts from their minds during working hours?

Not too effectively, without instituting some kind of Big Brother campaign. What we can do though is remove to a large degree the necessity for people to make business decisions. In other words, we can arrange for the decisions to be made automatically. By computers or business machines.

How can a machine make a decision? Easily, when set up to do so Business machines, computers, conventional punched card equipment, communicate in a language of their own.

(*To page* 95)

AMA conference will stress role of computers in "dynamic management"

Merits of buying or leasing a computer, automatic programming techniques are among topics to be discussed at New York meeting this month —

THE ROLE OF electronic data processors as the "core of a dynamic approach to scientific management" rather than as "super-clerks" will be emphasized at the Fifth Annual Electronics Conference of the American Management Association, to be held in New York March 2-4.

Subjects to be covered at the conference include the relative merits of buying, or leasing a computer; how to make effective use of automatic programming techniques; development of a continuous management inventory system; and new uses of computer abilities.

The opening talk at the conference on Monday, March 2, will deal with the present attitude of top management toward the whole field of electronic data processing. Cramer W. LaPierre, vice president, General Electric, will review the shortcomings as well as the advantages of electronic installations, and the potential of the computer in applying "scientific method" to business practices.

Planning a computing and data processing center so that progressive development rather than progressive obsolescence will result will be discussed by L. A. Ohlinger, chief of the Computing and Datamation Center, Northrup Division, Northrup Aircraft, in the second talk at the conference.

The afternoon session on the first day of the conference will be devoted to a panel session on the relative merits of buying, leasing, and sharing a computer, or of depending on a computer service center, and a discussion of effective use of automatic programming techniques. Panel members for the first afternoon meeting will be C. G. Abbott, manager, Administrative Services Dep't., Arthur Andersen & Co., New York; Harold F. Hatch, 2nd vice president, John Hancock Mutual Life Insurance Co., Boston; Edward Howard, manager, Electronic Data Processing Dep't., California Texas Oil Co., Ltd., New York; and Norman Oxley, assistant controller, Allied Chemical Corp., New York. Fletcher R. Jones, general supervisor, Integrated Data Processing, Columbus Division, North American Aviation Corp., Columbus, Ohio, will discuss the effective use of automatic programming in the day's closing session.

Tuesday's program will open with a panel discussion on "The Evolving Character of Electronic Data Processing Equipment." Panel members will be Ralph H. Eidem, national director, Data Processing, Ernst & Ernst, Chicago; Herman C. Heisser, partner in charge, Management Services Research & Consulting Division, Lybrand, Ross Bros. & Montgomery, Philadelphia; and Felix Kaufman, Management Services Research & Consulting Division, Lybrand, Ross Bros. & Montgomery.

Tuesday afternoon will be left free to allow registrants a chance to visit an exhibit of electronic data processing equipment which is to be held in conjunction with the meeting.

The Wednesday morning meetings will open with an outline of "New

(*To page* 93)

C. W. LaPierre

C. G. Abbott

H. Seidensticker

Traditional check cashing procedure took at least ten to twenty minutes

American systems approach brings peaceful revolution to Brazilian bank

Revitalized check cashing system liberates customer from long delays, and pacifies the impatient depositor —

by Martin Smith
Bruce Payne & Associates, Inc., Management Consultants, New York

THE IDEA of revolution in South America is associated in American minds with small countries and unstable governments. Not wanting to be caught up in any full sized (or small sized, either) revolution, it was a relief to me when I heard that my consulting assignment was to be in Brazil, the largest country in South America. In view of this, and inasmuch as I am a decidedly peace-loving type, it was a bit of a shock to me to discover that I was singlehandedly responsible for a new revolution in Brazil.

This was a bloodless revolution, of course. As a matter of fact, it was a paper revolution. A revolution in banking circles was created when we changed the check cashing procedure of the largest commercial bank in Brazil.

In every Brazilian bank, the depositors were accustomed to wait from ten to twenty minutes after they had presented a check for payment. Our revolution was born when we changed this procedure to less than two minutes. Needless to say, this bank has increased the number of its depositors by a considerable extent.

Most Americans will wait patiently in line at a teller's window in order to cash a check. But after it has been presented there is no waiting. In Brazil the depositors waited both before and after presentation.

This waiting period was necessary because each check presented for payment had to be examined for balance and signature. In addition, the check was processed and posted before being paid.

It doesn't take an expert in banking to realize why this isn't necessary in America. There are rigid laws governing forgery and rubber checks. Either the money is refunded or the individual is prosecuted.

In Brazil it is an absolute necessity to examine the checks before payment, because, due to the ambiguous Brazilian laws, if someone forged a check or wrote a check with insufficient funds, and he was fortunate enough to have his check cashed, he could get away with it. Banks, therefore, make sure that every check is valid before it is paid.

Making sure that every check is valid — that is, by checking balance and signature — helped to create this exasperating waiting period. Regardless of the layman's opinion of the South American — that he doesn't mind waiting and accepts his fate stoically— the fact is that he wants his money just as quickly as his North American counterpart.

We discovered in our first analysis, however, that it wasn't merely the acts of examination that created the time lag, but the *way* they were being done. Each step in the processing of the check took a certain amount of

(*To page* 94)

Sweda offers tape punching cash registers; Macy's plans major automation program

Sweda Cash Register Co. has announced development of a new equipment series, including tape punching cash registers, and tape reading electronic machines which can supply information for direct input into electronic computers.

The new Point-of-Sale cash register models can provide input data either in the form of punched paper tape or punched price tags. The models are small enough to be used wherever conventional cash registers are currently installed. The registers allow a coded register audit strip to be prepared directly at the point of sale, as individual sales are recorded. The complete audit strip for each day's sales on each machine can be used as direct input for the Sweda E-3 Electronic Audit Strip Reader, which reads and records the information. According to Sweda, reports can be prepared from the data for sales audits, sales clerks' commissions, department sales, merchandise class, etc.

Macy's to automate customer billing

Plans for the "largest automation program in department store history," were recently announced by R. H. Macy, in New York, which is ordering a $1,000,000 electronic system capable of preparing customers' statements at the rate of 50 a minute.

According to the store, the speed-up in preparation of statements will make it possible to bill charge account shoppers at least a week earlier than has been possible in the past, and will also make it feasible to include charges for purchases made within twenty-four hours of preparation of the statement.

"Record keeping in department stores has now reached mountainous proportions," Wheelock H. Bingham, president of Macy's, and Stanley C. Alleyn, board chairman of National Cash Register, the company which is developing the installation, declared in a joint statement. Attributing the rise in paperwork to the rapid growth of credit buying, they stated that a greater degree of automation was the only solution to the growing clerical burden.

The situation is complicated, Bingham said, by the fact that Macy's anticipates a growing shortage of trained clerical personnel.

(*To page* 37)

Tape by-product of cash register . . .

. . . can be used as direct input for Sweda Strip Reader

As ledgers are updated by operator, data are duplicated on tape by machine at rear

Tape punching accounting machines simplify drug company's accounts payable operation

United Whelan reduces processing costs, and eliminates need for highly trained personnel by machine installation which produces input data for tabulating department —

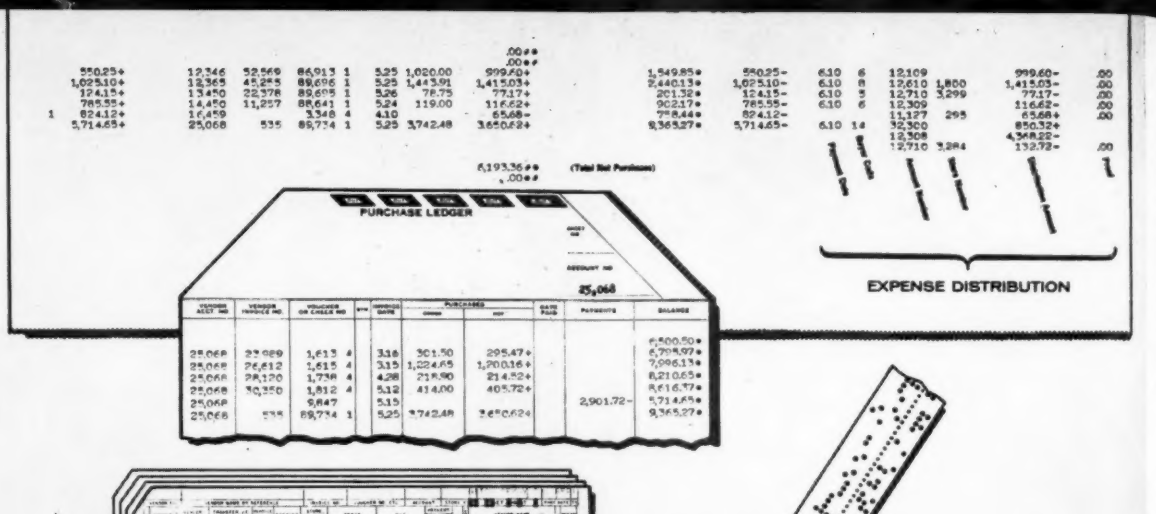
HANDLING ACCOUNTS payable that involve 20,000 vendors annually, $3,000,000 monthly and a posting volume of up to 2,000 ledgers daily is a huge job—but at United Whelan Corporation this work has been developed into a simple, rapid, accurate and economical system.

This system enables the machine operators handling the initial posting work to provide input media for later data processing as a by-product to posting the ledgers, thereby eliminating practically all of the work incident to the preparation of checks, remittance vouchers, expense distribution and general ledger data. This work formerly was handled by other bookkeeping machine operators, or manually.

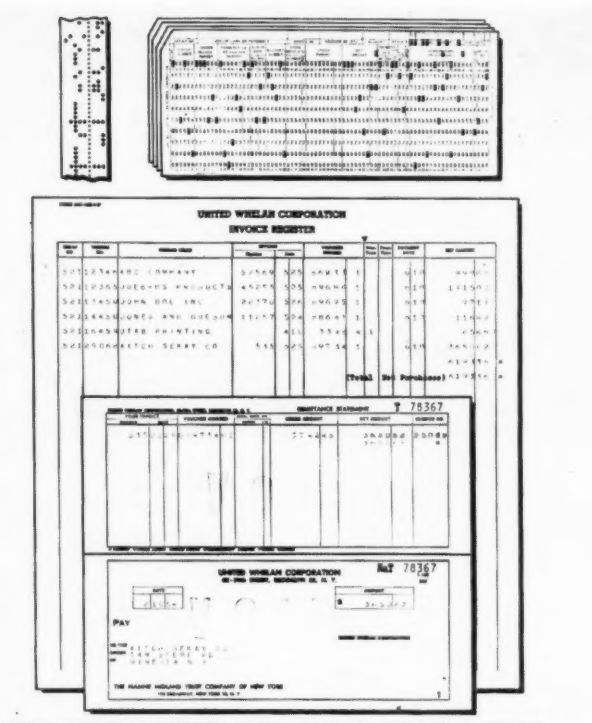
The key to this system is the use of accounting machines with tape perforators which automatically produce punched cards for use in the Tabulating Department.

United Whelan Corporation, formerly United Cigar-Whelan Stores Corporation, rates high among the nation's large drug and tobacco retailers. In its operation of some 132 Whelan Drug stores and through franchise agreements with over 500 United and Whelan agencies throughout the United States the company does a volume of well over $50,000,000 annually in drugs, tobacco products, cosmetics and sundry merchandise. Head offices are located in Brooklyn, as is the company's main warehouse. Branch quarters and warehouses are maintained in Chicago, Los Angeles and Miami.

In 1954, United Whelan moved its head office from New York City, where it had been located for over fifty years, to Brooklyn and consolidated this operation with the operation of its main warehouse. This move resulted in increased economy and efficiency in over-all operations. However, it also served to aggravate a number of



As purchase ledger is posted, distribution figures are entered on journal and simultaneously perforated on tape to prepare tab cards



Tab cards from tape used to prepare accounts payable records and journals

accounting and office problems for which Mr. Paul Olson, Vice President, Treasurer and Comptroller and Mr. Charles J. Sewall, Assistant Treasurer and Chief Accountant, had been seeking solutions, particularly in conjunction with the company's over-all expense reduction program.

In the case of the accounts payable operation, Messrs. Olson and Sewall were faced with three major problems: (1) how to obtain further substantial expense reduction; (2) a shortage of trained machine operators; and (3) obsolescence of existing equipment.

Sewall, assisted by Lester C. Ferre, Accounts Payable Supervisor, and Howard C. Klarman, Tabulating Supervisor, tackled the problem in the latter part of 1955. Although over-all cost reduction was the paramount goal, it was agreed that any new accounts payable system must provide for the retention of individual vendor's ledger accounts (considered essential for the company's particular type of operation) and also, if possible, should utilize existing tabulating equipment which had some "free time" available.

The survey which they made was extensive, and insofar as new equipment was concerned, that of several leading manufacturers was carefully studied. Burroughs equipment was selected because it was the only equipment available at that time which would permit subsequent data process-

ing on tabulating equipment and still not require an excessive capital expenditure. It also provided the most desirable feature of allowing the use of inexperienced personnel (especially those without typing training) as operators after a relatively short period of training.

Here is the system, using such equipment, which they now have:

Three, and during occasional peak loads four, Burroughs Sensimatic-To-Tape machines are used for posting vendor ledgers and simultaneously preparing purchase journals and perforated tapes. Cards from the tape are run through IBM equipment to write voucher-checks and to prepare expense and distribution reports and statistics.

When invoices have been processed and approved, they are distributed to the Sensimatic operators according to vendor name. The operators post ledgers by indexing the following information into their machines:

Previous balance due
Account number
Invoice number
Voucher number
Invoice date
Gross amount
Net amount
Payment date
Buyer's code number

This information is printed onto the ledger and journal, together with the new balance due to the account. It also is perforated into the tape, from which a payment card is made for subsequently preparing an invoice register, and later, remittance vouchers, checks and check register. The cards also may be used to analyze activity with any or all vendors.

Meanwhile, the Sensimatic operator distributes the expense on the journal, to the right of the ledger. To do this, she enters in the machine:

Distribution account number
Store or agency number
Distribution amount

If the distribution agrees with the ledger posting, a double-zero proof prints on the journal. If the figures do not agree, the error prints and an alarm hums from the perforator.

Cards obtained from the distribution information on the tapes may be used to secure any type of statistics desired, whether they be according to buyers, expense accounts, stores or amounts.

All ciphers are automatically printed on the ledger, journal and perforated into the tape.

To assure overall accuracy, an adding machine tape is taken of invoices. The total of this tape must agree with the invoice total on the journal produced during the ledger posting. In the Tab Department, the converted cards are first utilized to produce an invoice register. The total on the register must then agree with the Sensimatic journal total.

Payments are credited on the Sensimatic to vendors' ledgers from a copy of the check register, with a journal provided as a by-product. Again the journal total must correspond with the total established by the Tab Department. Tape units are not used during this crediting operation.

Although Messrs. Sewall, Ferre and Klarman point out the benefits of the system's simplicity, accuracy, speed and economy, they feel its most significant development is its solution to the problems of producing input media for data processing—and these media are provided as a by-product of posting the necessary ledgers.

The new system has also achieved the primary goals for which it was designed. A substantial reduction in payroll expense has been effected; simplicity of the new machines makes it possible to train existing personnel as operators whenever necessary; and eighteen old and obsolete bookkeeping machines have been replaced by five new machines, thereby substantially reducing upkeep and eliminating delays due to breakdowns, etc. Existing tabulating equipment is now being used to peak capacity, with a Tape-To-Card Converter the only new equipment added.

Automation—

(*From page* 34)

The installation will consist of an all-transistor NCR-304 computer and 40 other machines that will automatically service Macy's 750,000 New York customer accounts. According to Bingham, only one manual input operation will be needed to prepare the millions of statements the store must issue annually.

Although preliminary work on the system is now under way, it will not go into full operation until 1961.

The system as planned provides for information about each sale to a charge customer to be recorded on punched paper tape. The data processing system will automatically enter the transaction from the tape, and subsequently produce the customer's statement. In one hour, according to the manufacturer, the system will be able to handle punched tape carrying the information recorded on 300,000 sales checks.

Under the new program, copies of sales slips will no longer be sent with the bill, but the statement will provide a more detailed record of the customer's transactions.

7,200 computers now in use

During the last nine months of 1958, 624 general purpose electronic computers were installed in this country, according to a recent computer census conducted by John Diebold & Associates, Inc., New York management consulting firm.

This brought the total of all types of computers — large, medium, and small, and including electronic card computers — in use in the country at the end of 1958 to 7,200, according to the Diebold survey.

The census also indicated the quantity of each type of computer in use. Diebold classifies computers in four groups.

Under this breakdown by classifications, Diebold reports, there were 316 large-scale general purpose digital computer systems in use in the country at the end of 1958; 348 medium scale general purpose digital computer systems; and 1,370 small scale general purpose machines. In the miscellaneous digital computer group, there were 5,166 installations.

University computer center opens

The first university computer center specializing in business management problems was dedicated last month at the University of California at Los Angeles. Major areas of the Western Data Processing Center's research will include studies of a universal programming language to speed communications among different computers; of information flow within, to, and from a business system; and of the problems involved when a highly centralized data processing system is operated within a decentralized business.

"The Center's research facilities," according to the UCLA Chancellor, Dr. Raymond B. Allen, "will be used to speed development of a vast new profession of business managers trained to use the new techniques made possible by electronic computers."

A Monthly Feature

Tools of the Office

Copying and Duplicating Equipment

ONE OF the most striking aspects of business today is the rising tide of paperwork that threatens to flood the office. To help turn this flood into a more orderly flow, an increasing number of companies have found copying and duplicating equipment indispensable.

In presenting the case for copying equipment, one manufacturer states that a firm making an average of five copies a day of any paperwork can save approximately 275 man-hours a year by using a photocopy machine rather than typists to take care of regular copying work. In larger offices, where 50 copies of various originals are required daily, the same type of machine might save close to 2,800 man-hours.

This is the case for only one type of copying equipment. There are copying machines that work much faster, offering a greater potential saving of man-hours, and producing copies which, while they may not be of photocopy quality, are more than satisfactory for a number of purposes.

The case for duplicating equipment is, perhaps, even clearer. For runs of 100 copies or more, in fact, it is self-evident. In the case of comparatively short runs, say 50 copies, duplicating methods can still provide a great increase in efficiency.

The increase in efficiency provided by copying and duplicating equipment can, of course, be measured in terms of money saved, as well as time.

How do you decide whether extensive use of copying and/or duplicating equipment would increase the efficiency of your operation? One manufacturer of copying machines offers the following rule of thumb: When the typing load becomes so great that another typist must be added to the clerical staff to ease the burden, a copying machine will save both time and money.

It is also clear that such machines can eliminate bottlenecks. For example, a busy executive can have his secretary make copies of papers passing through his hands, and pass them on, almost immediately, to the next man in a routing system. And he can do so without waiting until his secretary is free to type a copy. In addition, most copying machines will pick up notations he may wish to add to the original material, so that answers to questions, opinions, etc. need not be written on a separate sheet.

Duplicating equipment can increase efficiency not only in cases where such things as notices or announcements are to be prepared for distribution, but also in complicated systems work.

Duplicating machines designed for systems work can prepare sets of related forms, copying repetitive information from one to the next much faster than it could be posted by hand. Some machines, in fact, can select certain lines and/or headings from one set of forms, and print them onto smaller forms.

Such machines are useful in accounting and sales departments, in inventory control, and a variety of other office applications.

Machines in both the duplicating and copying fields have been made more versatile by improvements in their design, sensitivity, etc. But perhaps the greatest improvement in versatility stems from the increased use of copying and duplicating equipment in combination with each other.

For example, most copying equipment can be used to make masters for use with at least one of the duplicating processes. This means that complicated material, that might once have taken many hours of patient and skilled work to transfer to a duplicating process master, can be transferred to such a master easily, and accurately. It can then be reproduced, by that duplicating process, at high speed, and inexpensively.

How do you decide which process or combination of processes would best serve your needs?

The first step is to analyze those needs. To take a hypothetical example: the home office of the "X" Company receives, throughout the week, a considerable amount of correspondence from outside agencies. In each case, the original material must be filed, and copies must be sent to the regional representative and the district manager. For this purpose, the company would probably choose a copying machine.

However, at the end of each week, stock reports, which often include sketches of displays, are prepared for distribution to numerous branch offices throughout the country. For this purpose, the company would probably choose a machine which uses one of the duplicating processes.

If this company is alert to the variety of processes and machines available, it may well choose a copying machine and a duplicating machine which complement each other. Each will be useful separately; and the copying machine will be able to copy the stock

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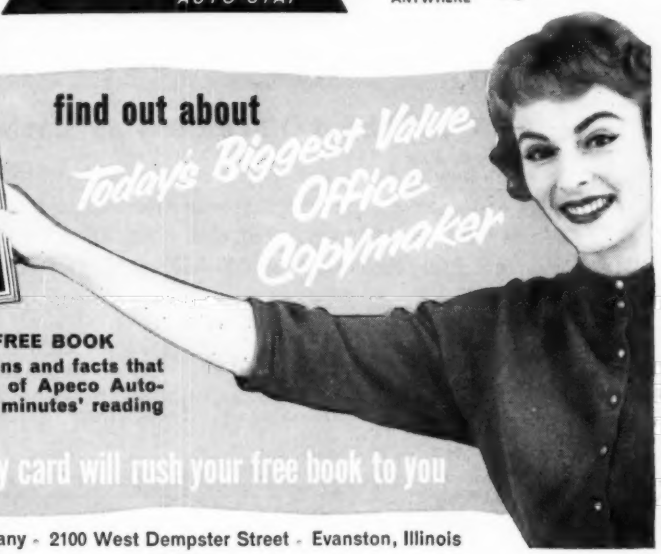
Now get copies of any original... typed, printed, photographed, written or drawn on one or both sides—it's so easy with the all-electric fully automatic Apeco DIRECTOR Auto-Stat. Unique "speed-feed" feature enables everyone to make perfect copies every time. It offers hundreds of money and time-saving applications for *every business*, large or small. Its low, low budget price makes it the most practical copymaker ever... ideal for branch office or departmental use. *COPY-QUIK feature converts the DIRECTOR into a high speed, multiple copymaker, when more than one copy of the same original is required. Now, if you need one copy or any number of copies, you can get them *fast* and *really* save too! Use this amazing new machine for all your copying needs

Styled by Charles E. Jones and Associates

APECO DIRECTOR AUTO-STAT

PLUG IN ANYWHERE

find out about Today's Biggest Value Office Copymaker



SEND FOR NEW FREE BOOK

This new free book is packed with illustrations and facts that point out the applications and advantages of Apeco Auto-Stat copying for every business. Here's ten minutes' reading that can save you thousands of dollars.

Attached postage paid air mail reply card will rush your free book to you

American Photocopy Equipment Company · 2100 West Dempster Street · Evanston, Illinois

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lists, including sketches, onto masters for use in the duplicating machine.

The needs of your own company can be analyzed similarly. It may be that the company needs *only* copying equipment, or *only* duplicating equipment. You may discover that an elaborate systems machine is required; or you may find that a simple machine, perhaps a portable, which is inexpensive and practically fool-proof in operation, is what you need.

In making the selection, it is important to be aware of the wide range of possibilities. This magazine recognizes at least a dozen distinct processes which can be used for copying or duplicating, exclusive of such methods as ordinary carbon paper, automatic typing, conventional printing methods, microfilm reproduction, or the output of integrated data processing systems.

No one process will serve every need. Some cannot copy two-sided material. Some cannot pick up certain colors. Some are satisfactory when only a few copies are needed, but are relatively slow or costly when multiple copies are required. Some can produce multiple copies at high speed, but cannot be used to reproduce certain kinds of materials.

However, the chances are very good that with so wide a variety of processes to choose from, a machine or machines can be selected which will save both time and money, and produce copies of precisely the quality required.

Six of the processes considered here are basically intended for copying. These are diazo, facsimile, photocopy, thermography, Verifax, and xerography.

Copying equipment is used to make copies of existing material without normally requiring the preparation of some intermediate, such as a master or stencil.

Such equipment is designed primarily for making relatively few copies of any one original. (However, the number of copies that can be made has been increased in some cases, most notably in the case of certain photocopy equipment, which, using recently developed chemical compounds, is designed to make multiple copies from one negative. See "Photocopy" below.)

Copying equipment can copy drawings, art work, and in many cases even photographs, directly from the original.

Duplicating equipment, on the other hand, is intended to make long runs at high speed, and at low cost per copy. In practice, each of the duplicating processes requires an intermediate, such as a master, stencil, or set type. Six processes are considered in this category: gelatin, offset, relief, special liquid, spirit, and stencil.

Even within the two categories—duplicating and copying—there is a wide range of differences. Some offer advantages of speed, some of low cost, some of quality appearance in the finished work—or a combination of any of these and other features.

The pages that follow describe, under separate headings, each of the twelve processes, and list manufacturers of each type of equipment with brief descriptions of the lines they offer.

It is hoped that this information will provide some guidance for those responsible for choosing equipment to serve their companies' needs.

The Copying Processes

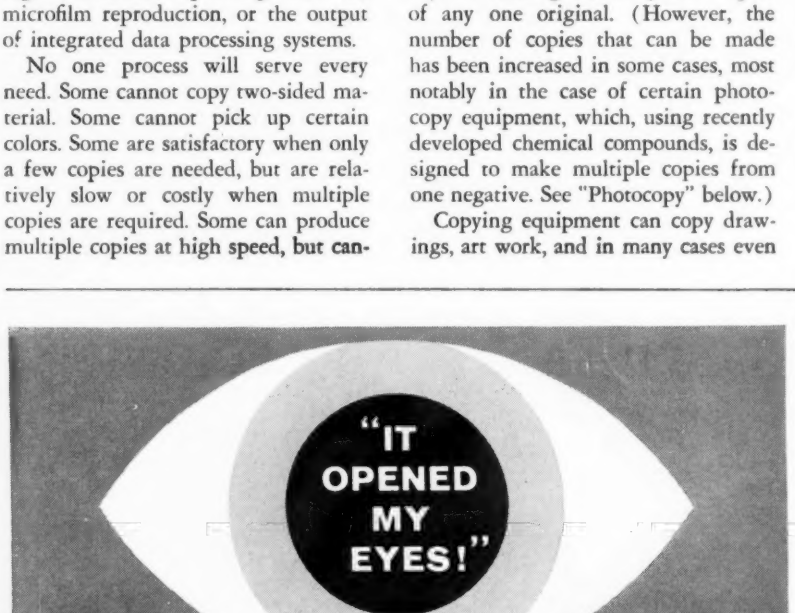
Photocopying

Photocopy processes employ the principles of conventional photography, so modified as to make photocopy machines convenient, reasonably simple office tools.

Depending on the combination of principles employed, true photocopying can take several different forms. All of them employ the chemistry of photography—as opposed, for example, to the chemistry of xerography, the diazo process, or thermography. All of them employ a mechanical arrangement in which copies are made through direct contact with sensitized materials—as opposed to the use of a camera or other optical systems.

The "transfer" method of photocopying is one in which the original material is normally placed face to face with the sensitized sheet which will become the negative. Original and sensitized sheet are exposed to light in a "printer," or in the "printing" slot of a combination machine. Light passes through the copy sheet to the original, where the dark areas (lines and letters) absorb it, and the lighter areas reflect it.

This reflected light produces a reaction in the light-sensitive coating of the copy sheet, altering it chemically so that it turns dark when it is developed.



"The Truth About Office Copying Machines"

tells you how to get perfect copies at lowest cost. All the advantages and disadvantages of all types of machines on the market, comparative cost of copies, speed, ease of operation, copy quality and range. Every businessman should read it before buying. **FREE!**

COPEASE CORPORATION 425 Park Ave., New York 22, N.Y. Box OM-3

DISTRIBUTORS IN PRINCIPAL CITIES. REGIONAL OFFICES:

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Gentlemen: I would like to have a 3-day FREE TRIAL of Copease in my office—without obligation ☐

Please send me a FREE copy of "THE TRUTH ABOUT OFFICE COPYING MACHINES" ☐

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Address_____

City_____ Zone_____ State_____

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Once the sensitized sheet, known as a negative, has been thus exposed, it is removed from the printing element, and separated from the original (which may now be returned to its file or user). The sensitized sheet is placed face to face with another chemically treated sheet.

Both sheets are inserted into the processor (developer), or the processing slot of a combination machine. Here a solution activates the chemical coating of the sheets, and the reaction produces a dye.

As the two sheets emerge from the unit, they remain face to face, and are left that way for about fifteen seconds, to complete the transfer of the dye. After this time, they are peeled apart, and the dye remains on the second sheet, forming an exact copy of the original material.

The "autopositive" method of photocopying uses only one sensitized sheet to make a copy. Normally, this sheet produces a white-on-black copy, which can be used in that form.

This is done by a method of exposure usually referred to as *direct* (whereas the face-to-face method, normally used in transfer copying, is referred to as *reflex*). In direct exposure, the original material is placed face up over the sensitized sheet. Thus the sensitized sheet is exposed to light passing through the original, rather than to light reflected from it.

Obviously, in order to make a copy which reads from left to right in one step, the original must be one-sided, and translucent enough to allow the passage of light.

If these requirements are not met, the original must usually be placed face to face with the sensitized sheet and exposed as in the transfer process. This produces a copy in which the printing is reversed, and a copy which reads from left to right can be made by repeating the process, using the copy as the new original.

It is possible, however, using certain types of equipment, to obtain copies which read from left to right in one step, even from two-sided originals. In this case, the original is placed face up *under* the sensitized paper, which is also face up. The coated side of the sensitized paper is covered by a special sheet of semi-translucent plastic.

The materials are so designed that the sensitized paper is largely shielded from the direct light, and responds to light reflected through it, from the original underneath.

a completely new office photocopy process . . .

Peerless Photo Products, Inc.
Shoreham, Long Island, New York

Gentlemen:

Please send me information about QUICK SILVER, the completely new office photocopy process which:

1. makes unlimited copies of superior quality from one negative.
2. makes right-reading copies in one-sheet operation.
3. eliminates peel-apart and throw-away sheet.
4. can be adapted to any office copy equipment.
5. cuts cost, time and labor.

NAME_____ TITLE_____

COMPANY_____

STREET_____

CITY_____ ZONE____ STATE_____

OM-3

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"It copies anything ... in 12 seconds! ...and the developing agent lasts a whole month!"

Here it is... Copycat's new deluxe wall model— world's fastest photocopier at any price!

Thanks to an exclusive new Copycat development, you can now have sharp picture-like copies of anything printed, written or drawn, *finished and ready-to-use* in 12 seconds!

The key to this speed and quality is Copycat's patented spray process — a process so startling that the machine can be used every day for a month or more without the need to change its developing agent. And since you never have to "warm it up" or clean its belts, Copycat runs practically unattended, is always ready for use.

Add to this the space-saving wall mount feature — a benefit you can take or leave because you can remove Copycat and carry it from desk to desk, from job to job, without fuss or bother.

If you've been less than satisfied with copying machines... tired of slow machines... fuzzy copies... messy developers... you owe it to yourself to see the new Copycat. Copycat is four times faster than any other photocopier and its developer lasts *five times longer*. Write or phone for a free demonstration in your own office today.

Copycat CORPORATION

you can't damage originals

215 Fourth Ave., New York • Phone: ORegon 4-5582

Standard copying cameras, while they do not employ what we have defined as photocopy techniques, can also be useful in the office. Use of a camera makes it possible to enlarge or reduce material, which is not usually the case in photocopying machines. The process is more elaborate than photocopying, and ordinarily requires more expensive equipment, and more detailed processing.

In some cases, the complete operation can be handled by one unit, in which the material is moved through the equipment by mechanical means. Some equipment, in fact, can be preset to make a specified number of copies by setting the proper controls.

As many copies as you want ... at less than 5¢ each ... and each in seconds with THE NEW ANKEN PLENACOPY PROCESS

- *Countless Copies from a single photocopying negative*
- *Full Fidelity* for any copying equipment*
- *No waiting*
- *No peel-apart*

FOR THE OFFICE – RECORD ROOM – ENGINEERING DEPARTMENT

Your present photocopying machine can be adapted for The Plenacopy Process, with simply a second processing solution tray — or this inexpensive Plenamatic Processor for the Plenacopy Monobath solution. Single-sheet Processing — no waiting ....no peel-apart.

*Full Fidelity — The Plenacopy Process now makes it possible to obtain crisp, clear copies — and as many as you want — using a transfer negative, (usually discarded) made in any of the standard copiers.

How to use the Plenacopy Process, in 100-plus ways to save time and money.... in the office, blueprint department, record room, art department and office forms duplicating.

Anken Film Company, Inc.
11 Hix Avenue • Newton, N. J.

Since copying cameras use true photographic procedures, the original must be exposed, and the final print must be developed, fixed, and washed. For convenience, such equipment may be equipped with a drying section so that the copies, which would otherwise have to dry for several hours, will emerge in immediately usable condition.

These cameras are usually provided with a prism arrangement, so that they can produce a negative which reads from left to right. If a black-on-white copy is desired, it can be obtained either by processing the negative as a new original, or by using materials that will produce black-on-white positives in one step.

New Developments

The news in photocopying stems from the development of chemical compounds which are designed to extend the photocopy method to situations where multiple copies are required, at less than prohibitive prices.

The photocopy process is *still* not suitable for long runs, and the production of a great number of inexpensive copies; but the process, noted for its ability to produce exact copies of good appearance, is now suitable for use in situations where, say, 15, 25, or even more copies are desired.

The precise details of the method vary from manufacturer to manufacturer, but essentially, all require the use of specially coated paper, and a special solution, containing both developer and stabilizer, or two solutions, where activator and stabilizer are separate, and the developer is actually in the paper itself.

In all cases, the reduction in price as compared to transfer photocopying is effected by using only one sheet for each copy, after the original negative — whether it is mirror-image, as in the transfer process, or right-reading, as in an autopositive process—has been made. Thus the original negative in effect becomes a master for making further copies.

If your company already has photocopy equipment, you may simply need to add an auxiliary processing unit (or in some cases, depending on the brand, merely a processing tank), in order to use these processes, since any photocopy printer can act as the light source to expose the negative.

If, however, your company is investing in photocopy equipment for the first time, you might wish to con-

sider a machine, now offered, which is a combination printer and processor, capable of making single, autopositive copies, and/or multiple copies.

Further details of the methods, and prices of the units needed for their use are included in the listing of manufacturers which follows this section, included as part of the line of the company that makes them.

Photocopy equipment, whatever the method used, is generally available in the form of separate printers, separate processors, or combination models. Combination models are generally of the continuous-flow type, and cannot copy from bound volumes. Many companies, however, offer flat-bed printers, which can copy either flat or bound material.

Photocopying produces exact copies of the original, and is sensitive to a wide range of colors. While most photocopy paper is white, it is possible to obtain it in other colors, for color coding and other uses.

Copies can also be made on film or on translucent materials, a convenient method for copying opaque or two-sided originals for reproduction by the diazo process.

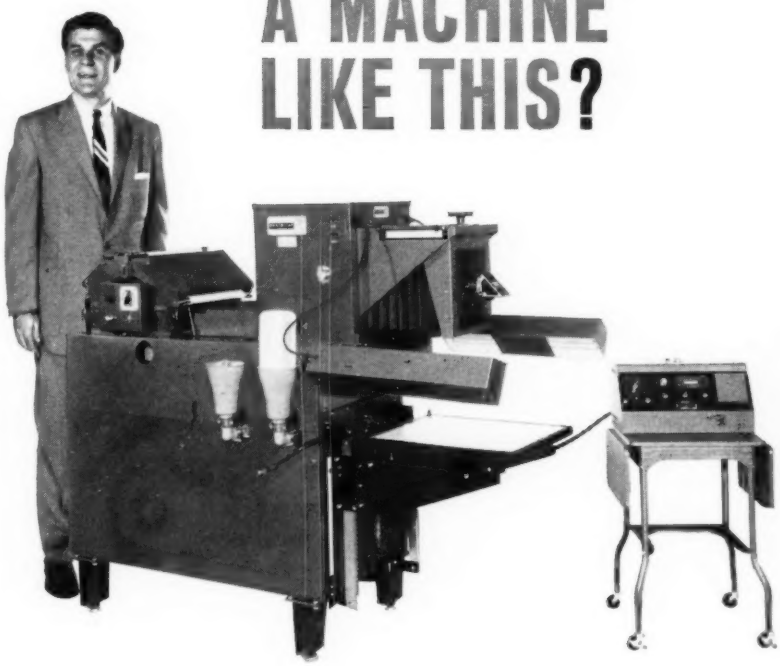
Some office photocopying machines can also make offset masters.

A modification of photocopying, known as Verifax, is discussed separately, since it differs from standard photocopying in certain significant ways.

The Manufacturers

American Photocopy Equipment Co., 2100 Dempster St., Evanston, Ill. Apeco's Auto-Stat line comprises three machines, which make copies ranging in maximum width from 11 to 14 inches, depending on the model. A special unit is available for copying bound material. The line features compact design (some units are portable) and speed: about 9 seconds for a black-on-white copy. Price range: $227.50 to $423.50. In addition, the company offers the Copy Quik process, a multiple copy process which utilizes the original transfer negative as a master for making additional copies, each additional copy requiring only one sheet of paper. The Copy Quik process requires a different developer from that used in normal diffusion-transfer photocopying. For use with the Apeco Uni-Matic or Dial-A-Matic machines, or competitive equipment, an accessory processor is normally required. Autostat proces-

WHEN SHOULD YOU BUY A MACHINE LIKE THIS?



Photostat® Photographic Copying Apparatus, Junior Continuous A, one of 3 models ideally suited for volume "in-office" photocopying.

All the evidence says: Quite a bit *before* it seems to be a wise move.

If, coming from us, that statement has a self-serving sound, bear with us for a moment.

Believe it or not, you will find it profitable to install such a unit when your estimated volume comes within 60% of justification. (Photostat Photographic Copying Apparatus works so dependably that you can figure accurately what each photocopy is going to cost.)

This is why it's profitable to be forehanded. As soon as your staff members realize that, by pressing a button, they can get quality copies every time at known costs, your volume of photocopy work rises sharply. What seemed to be a doubtful accessory soon proves to be an economic necessity.

Photostat Corporation *specializes* in copy methods for modern business. A Photostat Corporation representative — handling photocopy, microfilm, and offset equipment — can help you choose the system or combination of systems that will best serve your needs.

Your key to complete copy satisfaction
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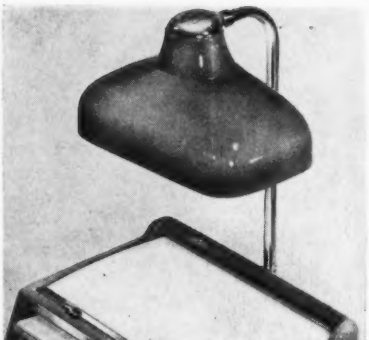


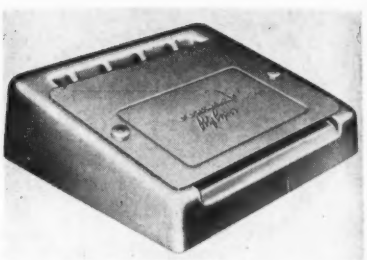
Nord photocopy machine produces black and white copies from any original

sor for use with Copy Quik: $137.50. If used with Apeco's Director model, an additional tank only is required.

Ampto, Inc. (Subsidiary of Anken Chemical & Film Corp.), 9 Hix Ave., Newton, N. J. Ampto offers two models, one accommodating material 9 inches wide by any length, the other taking material up to 14 inches wide

Peerless mobile, continuous flow unit can produce up to 450 originals per hour

by any length. The smaller unit is portable and has a carrying handle. Price range: $189 to $379. *Anken Film Co.*, another subsidiary of the parent corporation, offers the Plenacopy process, which can be used to make multiple copies from transfer negatives made on any machine. The process utilizes the transfer negative, heretofore usually discarded, as a master for making additional copies, using only one sheet for each additional copy and eliminating the peel-apart step. (The transfer



Cormac PolyCopy machine uses any negative sheet as master for multiple copies

negative must be dried with the least possible exposure to light, though not necessarily in a darkroom.) When the Plenacopy process is used with machines of the Ampto type, a second processing solution tray is all the additional equipment needed. A Plenamatic processing unit, for use with other brands of photocopiers, is also available. Price: $97.

Copease Corp., 425 Park Ave., New York 22. The Copease line comprises 12 models, including three fully automatic machines, two book copiers which combine exposure and developing of copies of pages from bound volumes, and a variety of separate exposing and developing units in different sizes. The smallest model will take copy up to 8½ by 14 inches. Of larger machines, one will take copy 17 by 24 inches, another will take copy 14 inches wide, and of any length. Price range: $250 to $397.

Copycat Corp., 215 Fourth Ave., New York 3. Copycat offers four continuous-type machines which will accept copy of any length, in maximum widths ranging from 9 to 14 inches, depending on the model. Two of the machines (with maximum copy widths of 10 and 14 inches respectively) can be attached to a wall mounting. In these two machines paper is sprayed with developer, rather than being immersed in it. Price range: $199 to $495.

Copycat also offers separate printers (flat-bed) and developing units.

Copy-Craft, Inc., 105 Chambers St., New York 7. The Copy-Craft line comprises five electrically powered and three manually powered models. Among the machines are some of the flat-bed type, which can copy pages from bound material. The smallest Copy-Craft model will take copy up to 8½ by 14 inches. One of the largest models will accept copy up to 18 by 24 inches; another will take material up to a maximum width of 15 inches and of any length. Price range: $178 to $530.

PORTABLE
PHOTOCOPIER
COPIES ANYTHING . . . ANY CONTOUR
use flat to copy flat documents
feather light . . . take it anywhere
develop at once . . . or weeks later at home or office
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Cormac Photocopy Corp., 80 Fifth Ave., New York 11. Cormac offers seven models, including flat-bed (which can copy from bound volumes) and continuous-type machines. The smallest model will accept copy up to 8½ by 14 inches; the largest will take copy up to 18 inches wide and of unlimited length. Price range: $149 to $374. In addition, Cormac offers the PolyCopy Process, which utilizes the transfer negative — from any photocopier — as a master for making multiple copies; the process eliminates the peel-apart step in making quantity copies. A Cormac PolyCopier, which will accept material up to 9 inches wide by any length, is priced at $79.50.

A. B. Dick Co., 5700 W. Touhy Ave., Chicago 31. The company offers one electrically powered photocopy machine which accepts copy in sizes up to 9 by 14½ inches, and which can copy bound material.

Duophoto Corp., 236 Fifth Ave., New York 1. Duophoto manufactures the Duomatic machine, which will accept copy up to 14 inches wide by any length. Price: $695.

Duophoto also offers the Quanticopy process, designed to utilize the transfer negative as a master for making single-sheet multiple copies. Price for the Quanticopy unit: $229. The Duophoto Corp. is a distributor for the Photorapid line. (See Photorapid listing)

General Photo Products Co., Inc., P. O. Box 23, Chatham, N. J. The Genco Exact-Fax line includes printing units, developing units, and combination models. The smallest combination model will take copy up to 9½ by 15 inches. Another can take copy to a maximum of 20 by 40 inches. One machine, available in portable or desk model, will take copy 9½ inches wide by any length; a larger machine will take copy 12 inches by any length. A combination outfit, consisting of a continuous printer and continuous processor takes copy up to 20 inches wide by any length. Price range: $80 to $450.

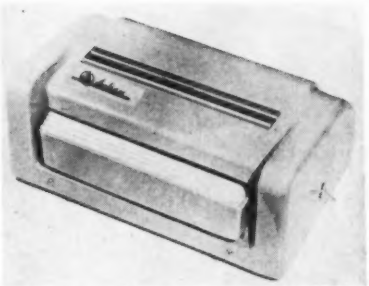
Hunter Photo-Copyist, Inc., 566 Spencer St., Syracuse, N. Y. The Hunter HeccoKwik line includes standard continuous-flow combination models, as well as separate developing units and flat-bed printers suitable for copying pages from bound material. Some machines are portable, and one, the Hunter Cub, is particularly intended for smaller offices.

Kenro Graphics, Inc., 25 Commerce St., Chatham, N. J. Kenro's process cameras, while not photocopiers in the sense used in this section, can be used to prepare, by photographic methods (using certain accessories) plates which can be run on office-size offset duplicators, and xerographic plates. The Vertical 18 Process Camera produces negatives to 14 by 18 inches. With the Prismatic Head (for photocopies), maximum negative size is 12 by 18 inches. With Xerographic head, 11 by 14 inches. Camera price: $1,250. Prismatic head: $427. Xerographic head: $100.

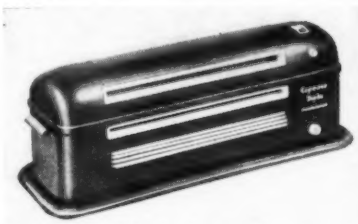
F. G. Ludwig, Inc., Coulter St., Old Saybrook, Conn. Ludwig offers the Contoura line, comprising five electrically powered and three manually powered machines. The smallest machine will take copy up to 8 by 10 inches. The largest will accept material of a maximum width of 14 inches, and of any length. Among the Contoura models are three which will copy bound material. Contoura also offers the Plenacopy process developed by Anken Film Co. Price range: $171.35 to $379.

Nord Mfg. Corp., 366 Jericho Turnpike, Mineola, L. I., N. Y. The Nord line comprises three models, the smallest of which will take copy up to 9 by 15 inches, the largest of which will accept material up to 15 by 18 inches. The machines will copy bound material, and some will transfer material

(*To page* 50)



The Anken Plenacopy process produces multiple copies from transfer negatives



Copease "Duplex" photocopier exposes, develops, prints copies up to 14 inches wide

Nothing compares with the smooth performance, amazing speed and brilliant copywork of the *new* TRANSCOPY STAR Photocopier. *3-second exposures* return originals to you in a flash! Finished prints come out crisp and clear black on white copies. Everything is reproduced with clarity . . . even signatures, stamps and colors! And a single dial control assures professional perfection with every copy.

Write for free literature.

"as essential as a typewriter"

Remington Rand
DIVISION OF SPERRY RAND CORPORATION
Room 1358, 315 Fourth Ave., N.Y. 10
Please send me a free copy of folder P544 on the *new* TRANSCOPY STAR and TRANSCOPY MERCURY* Photocopiers.
*Companion model for copying large size documents.
Name & Title _____
Company _____
Address _____
City _____ Zone ____ State ____
2

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The office copier that saves you most is only "stepping distance" away!

Put a Verifax Copier in every department for quick and low-cost copying service!

From a convenience standpoint alone, it's well worth while to have a $99.50 Verifax Bantam Copier in every department.

You get copies fast as needed—no more annoying waits. Your secretary is always available—no more 10-minute walks to a distant copier.

As systems men see it, this is far more than a convenience. It's smart management! For your company-wide savings in secretarial travel time alone (about 24¢ on each 10-minute trip) can pay for your Bantam Copiers in a month or two.

Add to this the extra savings which you and your secretary will get—everyone in your company will get—by making full use of all the wonderful Verifax copying short cuts in daily routines and special systems applications.

Fully capable—yet only $99.50

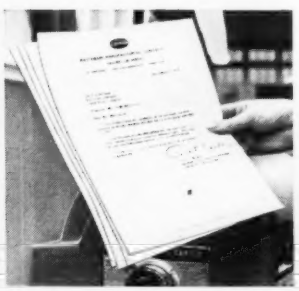
Despite its surprisingly low price, the new Bantam is a true Verifax Copier in every sense. Simple for anyone to operate. And so trim and compact you will find room for one in the smallest office. It's one of four fine models now available.

Call in your local Verifax Dealer for a demonstration of the Verifax Bantam Copier, and an estimate of the savings possible in your company with decentralized Verifax copying. (Check "Yellow Pages" under duplicating or photocopying machines.)

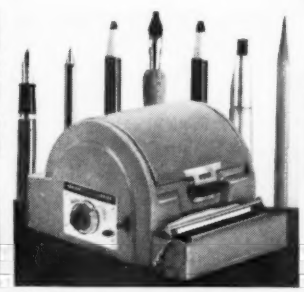
Price shown is manufacturer's suggested price and is subject to change without notice

Kodak Verifax Bantam Copier outperforms copiers costing up to 4 times as much!

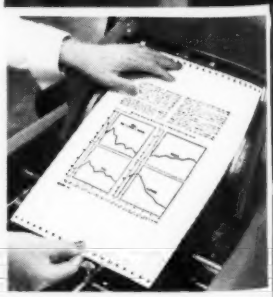
Makes 5 dry, clean, white copies in 1 minute for 2½¢ each. Verifax copies can be made on one or both sides of bond-type paper, card stock, your own printed office forms.



Verifax copies are accurate and complete . . . easy to read—have the look and feel of a good letterhead. And they'll last every bit as long as any typed record, won't fade or darken.



Write with anything — you can copy ball-point, crayon—what have you — as easily as typed data. And those purplish duplicator copies and rubber stamps are a snap to copy.



Even makes an offset master in 1 minute for less than 20¢ with low-cost adapter. A translucent master for whiteprint or blueprint machines can also be made in 1 minute for about 10¢.

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At Raytheon Manufacturing Co., Waltham, Mass., more than 30 Verifax Copiers speed paper work.

Verifax Copying DOES MORE . . . COSTS LESS . . . MISSES NOTHING

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Gentlemen: Send booklet describing Verifax Copiers and short cuts for boss and secretary. Also names of nearby dealers. **72-3**

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Kodak TRADEMARK

Use Readers' Inquiry Coupon on Page 102

Tools of the Office

(*From page* 47)

to special, sensitized offset plates. Price range: $179 to $345.

Peerless Photo Products, Inc., Shoreham, L. I., N. Y. Peerless' line of Dri-Stat photocopy units includes five continuous type machines, and one flat-bed printer, which can copy from bound material. Continuous-type units can take copy of any length, and in maximum widths of 9 to 14 inches, depending on the model. Special feature is automatic feed through processor. Price range: $195 to $685. In addition, Peerless offers a new process called Quick Silver. This can be used to make a single autopositive copy, (white on black) in a single sheet operation, or to make multiple copies from a single permanent negative, produced in a single-sheet procedure which eliminates the peel-apart step. One Quick Silver combination printer and processor is available, taking copy in a maximum width of 9 inches, and of any length. (A larger model is also planned.) A separate processor, designed for use with Peerless or other brands of photocopy equipment is also available. Price range: approximately $150 to $350. Peerless also offers the Copy-Cart, a mobile unit designed for continuous-flow copying of as many as 450 8½ by 11 inch originals per hour. Maximum copy size accepted is 9 inches by any length. In copying, machine reduces material to 70 per cent of size of original. Price: Under $5,000.

Photorapid. The Photorapid line, manufactured in Switzerland includes electrically powered models of both the flat-bed and continuous type. The smallest machine will take copy up to 9 by 14 inches; the largest will accept material up to 24 inches wide and of any length. Some models can copy from bound material. The Photorapid line also includes MagiPlate, an aluminum offset plate, maximum size 11 inches, which can be made on the Photorapid Transfer Unit for use on offset machines. Price range for machines (approximate): $169 to $549. The Photorapid line is distributed in this country by: *Duophoto Corp., 236 Fifth Ave., New York 1; W. F. Mullen Co., 3620 Oakton St., Skokie, Ill.: Pacific Copy Co., 142 Oregon St., El Segundo, Calif.*

Photostat Corp., 1001 Jefferson Rd., Rochester 3, N. Y. The company offers the Photostat Instant Copier, available in two models. Maximum size of printed area is 8½ by 11 or 14 inches, depending on the model. An adapter is available for making offset plates. Photostat also distributes Verifax equipment. (See "Verifax" section.) Photostat's basic line comprises photographic equipment of the camera type (as opposed to the contact or transfer type normally implied in the term "photocopier"). The line includes models which can make prints 8½ by 11 inches or smaller, and ranges to models suitable for engineering drawings and other large material, which can print areas up to 18 by 24 inches. The equipment can enlarge or reduce. Both negative and positive right-reading copies can be produced. Features include special subject holders for automatic feed, book holders, registration devices. Price range: $1,245 to $12,015.

Remington Rand Division, Sperry Rand Corp., 315 Fourth Avenue, New York 10. Remington Rand's machines include continuous-type and flat-bed printers of the Transcopy line, as well as camera-type equipment of the Dexigraph line and a variety of microfilm units. Transcopy units include combination printers and processors as well as separate processors. Flat-bed units can take copy to maximum size of 20 by 24 inches. Continuous-type units can take copy of any length, in maximum widths of 9½ to 15½ inches, depending on the model. Transcopy price range: $84.50 to $299.50

Robertson Photo-mechanix, Inc., 7440 Lawrence Ave., Chicago 31. Robertson offers a line of camera equipment and accessories which can be used to prepare xerographic plates for duplicating equipment, as well as making film copies. The line includes machines which can enlarge or reduce size. Some of the equipment requires a darkroom; some can be used in a lighted room. Price range: $1,270 to $2,100.

Rovico Inc., 318 Market St., Newark 2, N. J. Rovico's Fotomate line includes three continuous-type machines, accepting copy in maximum widths of 12, 15½ and 19½ inches, depending on the model; all accept copy of any length. An additional attachment permits copying from bound volumes. Price range: $225 to $425. In addition, Rovico offers the Rovicopy process for making multiple copies from one negative, using a single sheet for each copy. For use with a Fotomate machine, a Rovicopy developing tank is offered at $14.50. A separate developing unit is available at $79.50.

Verifax

The Verifax process is a variant of photocopying. It differs from the latter in that it can make copies on ordinary, non-sensitized papers, and in its ability to produce at least five copies from a single exposure to the light source.

In the Verifax process, the original material is placed face-to-face with a sheet of sensitized paper which is called a "matrix." Original and matrix are exposed to a light source in such a way that the light passes through the matrix to the original. Thus, in this first step, the process corresponds to that used in most transfer photocopying. As in that process, the dark areas of the original absorb the light, while the lighter areas reflect it.

Where the reflected light strikes the light-sensitive matrix, a chemical reaction occurs, which inactivates those areas of the matrix.

After exposure to the light source, original and matrix are removed, and the matrix is placed in the developing section of the unit, where it is processed by an "activator" solution.

Those areas on the matrix which correspond to the dark areas of the original now react to form a dark, dye-like substance. It is this substance which is transferred to the final copy sheet.

To effect the transfer, a sheet of non-sensitized copy paper is placed face to face with the matrix, as it emerges from the developing unit. The two sheets are pressed together by squeegee rollers. As a result, a layer of the dye is transferred to the copy paper, to make the final reproduction of the original.

However, not all of the dye produced is thus removed. Enough remains on the matrix to make about four more copies; though if lighter copies are acceptable, with care up to ten can be made.

Since the final copy does not pass through a solution, it emerges completely dry.

The Verifax process, like the photocopy process, can copy a wide range of originals: art work, letterheads, typed, drawn, or hand-written material, and coarse-screen photographic halftones. Since it uses the reflex method of exposure, it can copy opaque or two-sided originals without an intermediate step.

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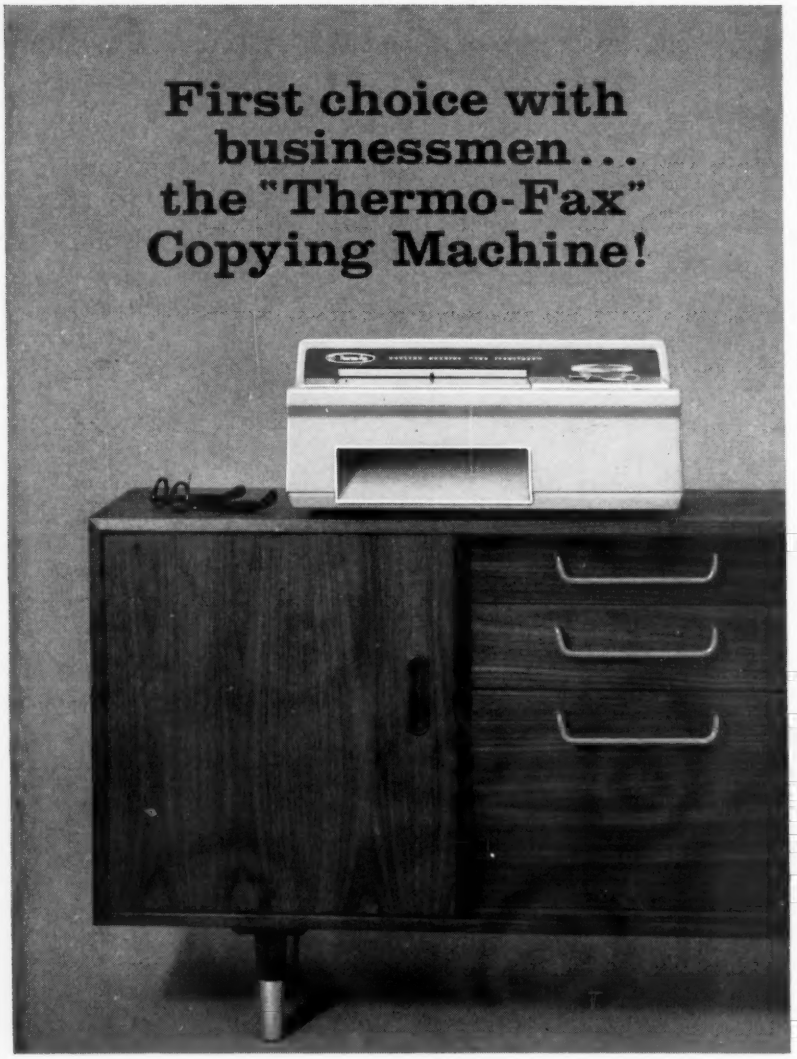

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Please send me details on how the "Thermo-Fax" Copying Machine will help me cut costs in my business.

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Company _____

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Copies can be made on card stock, and, if desired, on both sides of a sheet.

The process can also make offset masters, in about one minute, using an accessory unit.

The first copy takes about fifty seconds to make, but additional copies can be made much more rapidly.

The Manufacturer

Eastman Kodak Co., Rochester 4, N. Y. The Verifax line includes four machines which can copy originals in maximum sizes ranging from 8½ by 11 to 10 by 16 inches. Price range: $99.50 to $425. The company also offers Verifax Offset Adapters which utilize the Verifax process to make transfers onto paper offset masters which will provide a run of 1,000 or more copies. Two models are available with maximum copy sizes of 9 by 14 inches and 10 by 16 inches respectively. Price range: $60 to $98.50. *Photostat Corp., 1001 Jefferson Rd., Rochester 3, N. Y.* Photostat distributes the Verifax line of equipment.

Thermography

Thermography is the proper name of the process which is more commonly known, in office use, by the brand-name of the machine that uses it: Thermo-Fax.

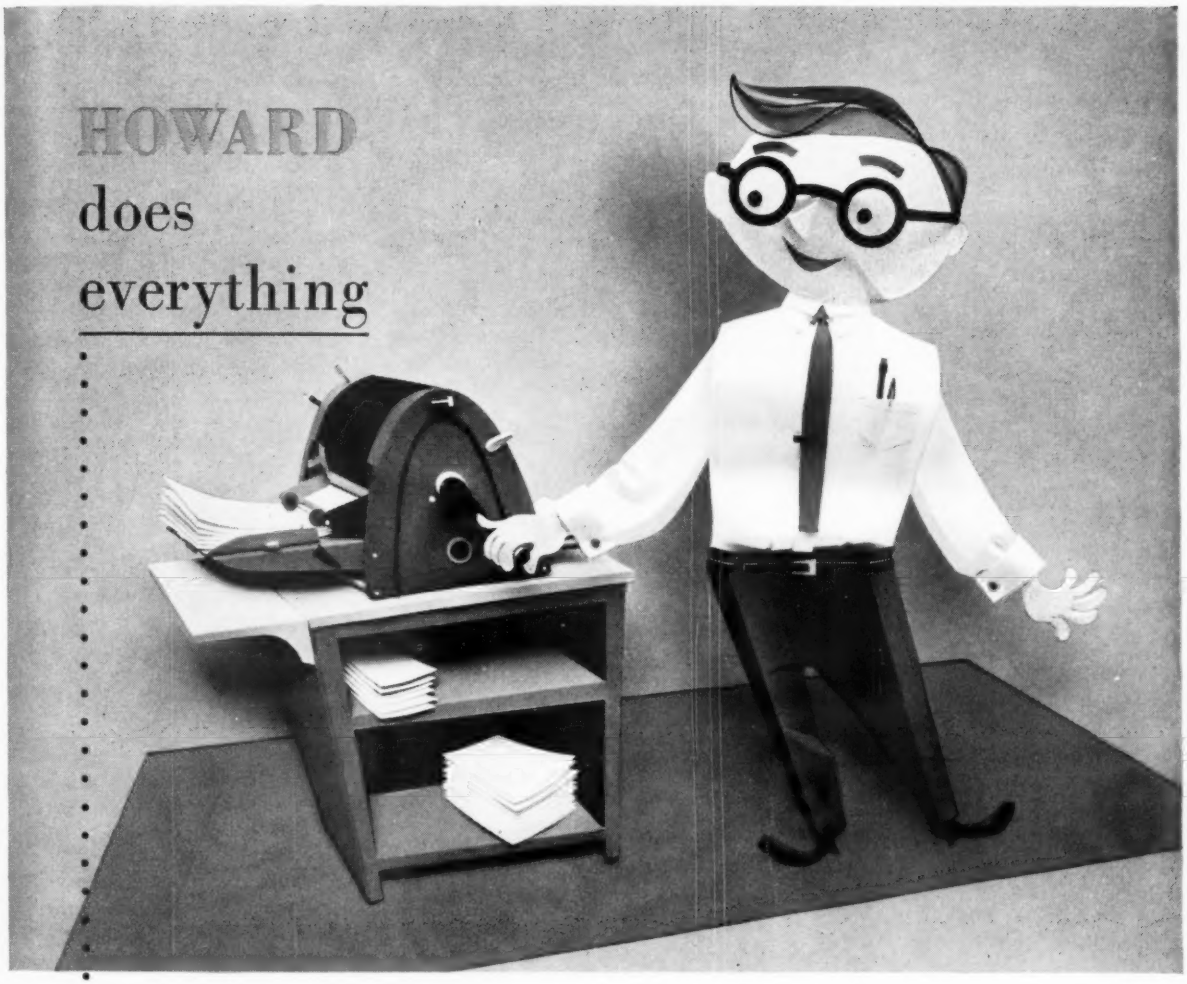
The process makes use of the fact that dark substances, such as office ink, tend to absorb more light than light-colored substances. In the process of absorbing light, the dark substance generates heat. It is heat that "burns" the copy paper, producing the image.

The copy paper used is heat-sensitive, and responds to heat by turning dark.

Mechanically, the process operates as follows. The copy paper is placed, with its heat-sensitive coating face up, on top of the material to be copied. In the Thermo-Fax machine, the two sheets are exposed to an infra-red light source. The light passes through the copy paper to the original.

Where the light strikes the darker areas formed by letters, lines, numbers, etc., it is absorbed, generating heat. The portions of the copy paper directly above the lines and letters turn dark, thus reproducing the material beneath.

Thus, in the thermographic process, copies are produced in a single step. Since no solutions are used, the copies are completely dry as they emerge from the machine.



. . . around the office

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Take Howard Duplicator and Mimeograph Papers, for instance: Howard Watermarked, and Workwell. Each is a perfect example of its grade, Workwell being thriftier, and each comes in classic clean, clear colors and brilliant white. Then there is Clearmaster, a master paper for the white-print process, and the well known Verifax paper, both manufactured by Howard for efficient, thrifty service in the duplicating field. All are in use in thousands of offices —as are all the other lines for every business and office use, made by the four divisions of Howard Paper Mills, Inc.

Remember "Howard"—an easy name, a good name—to remember.

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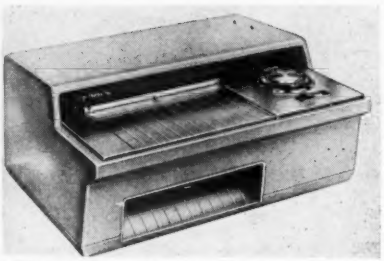

Thermo-Fax "Secretary" features fast, dry copy process utilizing sensitized paper

It a fast process; letter-size copies can be made in about four seconds.

Equipment for the process is available in two types: flat-bed printers, which can copy from bound material, and continuous models. Machines of the continuous type are designed so that original and copy paper are inserted into the machine, and are then brought before the light source, and out of the machine again by mechanical means.

The process is most successful in copying materials printed in a heat-absorbing ink, such as those with a carbon base, or in pencil. Certain inks, particularly some of the blue ones, may not record at all. These may be used to make notations on the original which are not desired on the copies.

The copy paper is translucent, and has a smooth, wax-like finish. Standard paper is buff-colored, but other colors, and white, are available. Printing is blue-black.

The copy paper is light-weight; if reinforcement is desired, inexpensive back-up paper may be bonded to it within the machine itself.

The Manufacturer

Minnesota Mining & Mfg. Co., 900 Bush Ave., St. Paul 6. Three Thermo-Fax machines are offered, all of table-top size. One model, the Premier, is of the flat-bed type which can copy from bound material, as well as flat sheets; maximum copy size is 9 by 14½ inches. The other two models are of the continuous type: the Secretary accepts copy up to 8½ inches wide; the Fourteen takes copy up to 14 inches wide. Copy length is unlimited. The company also offers supplies designed for special uses with the equipment, including pencils, inks, typewriter ribbons, special papers, etc.

Xerography

The xerographic process makes use of the fact that like electrical charges repel each other, while unlike charges attract.

In the actual process, the following steps occur:

First, using a copying camera, the image of the material to be copied is projected onto a coated plate, which bears a positive electrical charge. Light acts on the plate to cancel the electrical charge.

Since light is reflected only by the lighter-colored portions of the original, the plate retains its charge in those areas corresponding to the dark lines and letters of the original. Thus the image has now been copied in the form of an invisible electrical charge.

In the developing process, a dark resinous powder, carrying a negative electrical charge, is passed over the

Haloid Xerox machine enlarges microfilm drawings mounted on data processing cards

plate. Because unlike electrical charges attract, the powder adheres to those areas of the plate which represent the letters and lines of the original, making the image visible.

To make the copy, a sheet of paper, positively charged, is placed over the plate. A portion of the negatively charged powder is attracted to the paper. (It is possible to obtain up to eight copies from the powder which remains on the plate).

The paper, with the powder adhering to it, is then placed in a "fuser," where it is exposed to heat. This embeds the powder firmly in the paper, producing a permanent copy.

In the same manner (and at the same time that paper copies are being made), a paper offset master can be produced.

The process can also make presensitized positive working metal offset plates, spirit masters, and translucent copies for use with diazo process equipment.

The xerographic process can copy typed and handwritten material, drawings, art work, photographs, letterheads, etc. The original material can be opaque and two-sided, since the image of the original is *reflected on* the plate.

Copies are most often black on white paper, but paper of various colors and weights can be used. Some cameras permit enlarging and reducing.

While single copies generally take about three minutes to make, some new equipment using the xerographic process is of the continuous-flow type. Here, the entire process proceeds automatically, once the original material has been fed into the machine, thus making possible high speeds.

The Manufacturer

Haloid Xerox Inc., 6 Haloid St., Rochester 3, N. Y. The Xerox line includes cameras, fusers, processors, continuous printers, and accessories. Cameras, depending on the model, can enlarge, reduce, or make same-size copies. Panel and book holder attachments are available for use with copying equipment. Single copies can, of course, be made, but the equipment is especially suitable for making masters for offset, diazo, or spirit processes, thus serving as a valuable adjunct to duplicating systems. XeroX Copyflo continuous printers use the xerographic method to reproduce material, particularly from microfilmed frames or roll microfilm, at a rate of 20 linear feet per minute. Maximum size of printed area is 11 inches or 24 inches wide by any length, depending on the model.

Facsimile

The facsimile process, while generally used as the basis for communications devices, has certain copying and duplicating applications which are useful in office work.

Most facsimile equipment is basically designed for long-distance communication (it is used, for example, to transmit telegrams directly from a central office to the office of a subscriber). In effect, it provides single-copy duplication at a distance. However, it can also provide copies close at hand, and some equipment is now designed for office use.

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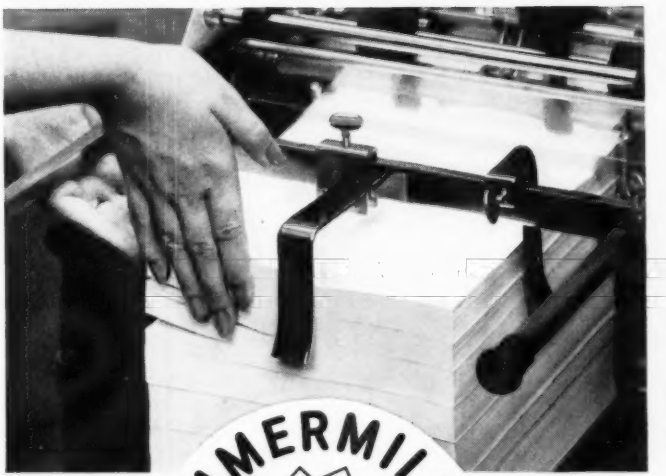

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COMPARISON OF OFFICE COPYING PROCESSES

COPYING PROCESSES. These processes are used to copy original material, including letters, art work, photographs, drawings, letterheads, etc. They are ordinarily used for making from one to ten copies, though new photocopy processes make multiple copies relatively economical, and most copying processes can also prepare stencils or masters for one or more of the duplicating processes.

Process	Speed*	Cost Per Copy*	Can Process Enlarge or Reduce?	Duplicating Processes for Which Stencils or Masters Can Be Prepared	Characteristics of the Process
Diazo	200-800 copies per hour	about 1 cent	No	Offset	Copies are positives, in various possible colors. Translucent, one-sided originals required, or translucency must be made first. Process sensitive to most colors, less so to purples.
Facsimile	1 copy in 3 minutes	5 cents	No	Offset; Stencil; Gelatin; Spirit	Copies are positives on specially treated paper. Process is used widely for wire communications, is getting increased use for stencil cutting.
Photocopy	1 copy in 15 seconds —1 minute	4-9 cents	Most cannot	Offset; Stencil (in special units)	Copies are positives on white or colored coated paper; some units make negatives. Sensitive to wide range of colors. Can make translucencies for diazo process. Some units can make several prints from one negative, and a number of companies now offer single-sheet multiple-copy processes, which utilize the original negative as master.
Thermography	1 copy in 4 seconds	4½-5 cents	No	None	Copies are positives on buff or colored paper having a wax-like finish which can be reinforced with heavier backing. Process less sensitive to some kinds of ink.
Verifax	1 copy in 50 seconds; 5 in 1 minute	9-10 cents (single); 2-4 cents (multiple)	No	Offset	Copies are positives on bond or similar non-sensitized paper. Several prints can be made from one matrix. Process is otherwise similar to photocopying.
Xerography	1 copy in 3 minutes	5 cents	Yes	Offset; Spirit	Copies are positives on various kinds of paper or film. Process is widely used to make offset masters. It is sensitive to wide range of colors. Can make translucencies for diazo process.

*Speed and copy costs are estimates for letter-size copies using materials of average quality and runs of average length. As circumstances vary, figures above or below those listed may be obtained. Speed figures allow not only for machine differences but for differences between manual and power operation.

These office-type machines are used to make copies or, more particularly, to transfer material to stencils, and to offset, gelatin and spirit masters, for use on standard duplicating machines.

The process itself is basically a photo-electric one. Both the original material and the sheet on which the copy will appear are "scanned" simultaneously, and in synchronization. In most cases, the material to be copied is wrapped around a rotating drum. The copy sheet is wrapped around a second drum which rotates in synchronization with the first. A narrow light beam passes in a continuous track over the entire surface of the material to be copied.

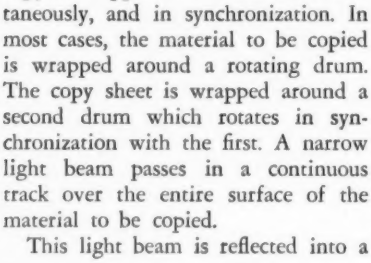
This light beam is reflected into a photo-electric cell. There it generates a current which varies with the strength of the reflected light. (The strength of the light depends upon whether it is being reflected from a light or a dark area.)

The current thus generated is transmitted to the receiving unit of the machine, where it activates a stylus, which passes over the face of the copy sheet, in synchronization with the original light beam. Through the stylus, the electric current "burns" the image onto the sensitized copy sheet. The machines are so designed that the current passing through the stylus produces dark areas which exactly correspond to those of the original material, thus producing a facsimile copy.

In some machines, the material to be copied is "scanned" as it enters the machine, rather than being wrapped around a drum. Units of this type can accept copy of unlimited length.

Receiving units may be modified so that the stylus can be used to make minute holes in the copy sheet. Thus, the machine can reproduce an image on a conventional stencil, for use with standard stencil duplicating machines.

Since scanning can generally be set in spacings as close as 750 to the inch, the facsimile process can be used to transfer art work (including photographs), drawings, letterheads, and other detailed material — as well as typed or written matter — to stencils. Used with suitable materials, it can copy such material onto masters for gelatin, offset, and spirit duplicators, or prepare translucent copies for use with diazo equipment.



Rex-Rotary "Electro-Rex" electronic stencil cutter utilizes facsimile process

The Manufacturers

Rex-Rotary Distributing Corp., 387 Fourth Ave., New York 16. The Electro-Rex is an electronic stencil cutter which can produce stencils or plates from drawings, typed matter, office forms, screened photographs, etc. Maximum size of the printed area is 8 by 12½ inches. Scanning may be set at spacings from 125 to 750 lines per inch. Price: $1808.

Gestetner Duplicator Corp., 216 Lake Ave., Yonkers, N. Y. The company offers the Gestefax, an electronic scanning machine which can produce stencils from typed matter, half tones, paste-ups, etc. Maximum size of the printed area: 8⅜ by 13½ inches.

Times Facsimile Corp., 540 W. 58 St., New York 19. This company's Stenafax equipment electronically

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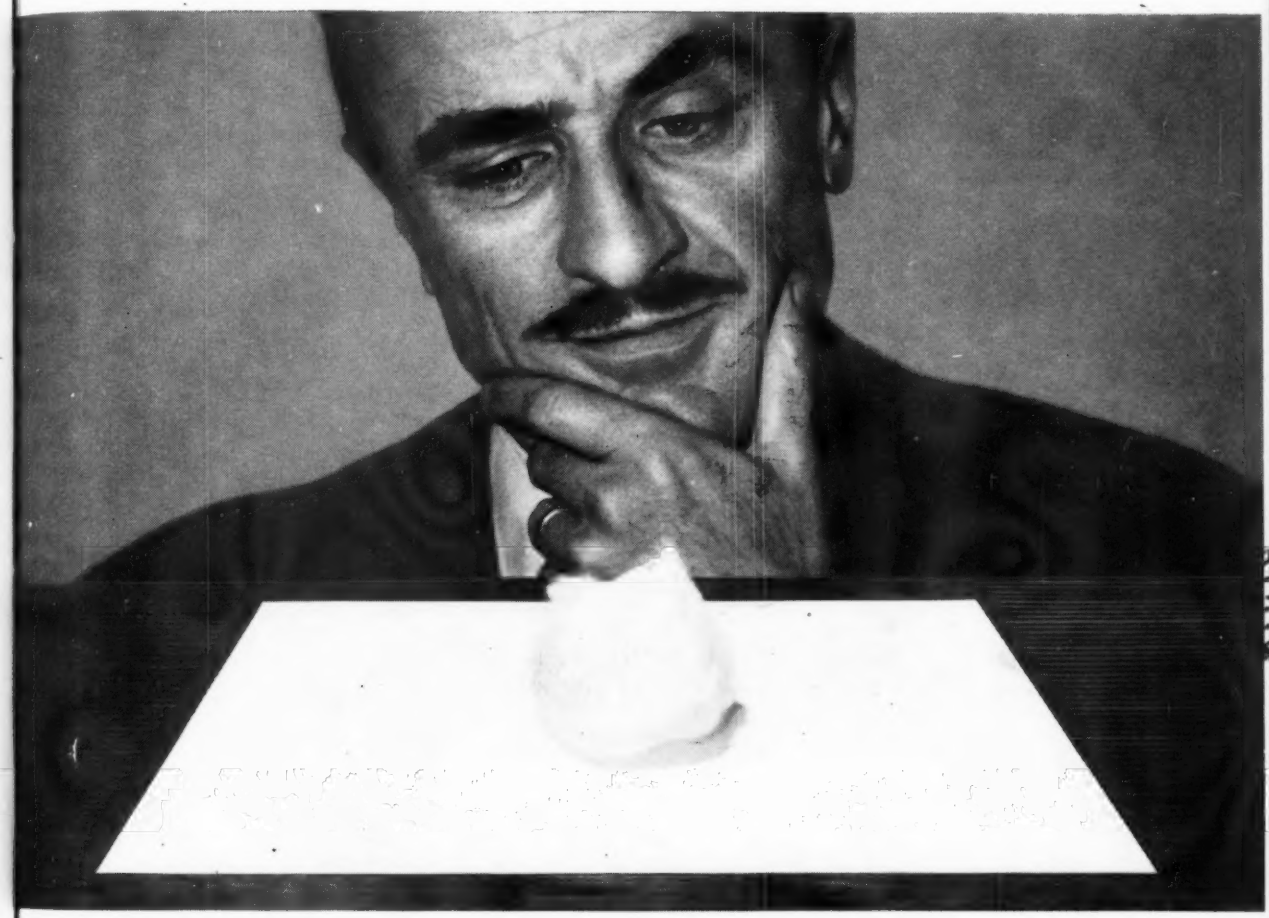

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COMPARISON OF OFFICE DUPLICATING PROCESSES

DUPLICATING PROCESSES. These processes are intended to make multiple copies at high speeds. A master, plate, or stencil must be prepared, or type must be set. Except for the relief process, masters and stencils can be prepared by typewriter, by hand, and by one or more of the copying processes. Costs per copy vary greatly with the length of the run and the quality of materials used. Assuming a run of more than just a few copies, costs per copy are a fraction of a cent. Because of the wide variations possible within each process, no attempt is made to compare them costwise.

Process	Speed* (Copies Per Minute)	Length of Run for Which Best Suited**	Copying Processes Which Can Prepare Masters or Stencils	Characteristics of the Process
Gelatin	10-75	10-100	Facsimile	Prints on paper with glossy finish. Best copies from purple carbon, but other colors can be used and can be run simultaneously. Copies become fainter as run continues.
Offset	75-150	10 to many thousands	Diazo; Facsimile; Photocopy; Verifax; Xerography	Copies are of high quality. Ink and paper color can be varied; one ink run at a time. Equipment requires reasonably experienced operator.
Relief	40-100	300 to 100,000	None—type must be set	Copies resemble typing or printing, depending on whether ribbon is used. Process often used for "fill-in" items and work with changing copy, since type can be changed during run. Prints one color at a time on any color paper.
Special Liquid (AZOGRAPH; CHEMOGRAPH; COLUMBIA TRANSFER)	40-120	10-125	None at present	These three processes perform like the spirit process, but feature "cleanliness"—printing dyes are not formed until paper enters machine, to avoid stain hazard. Printing color is approximately blue-black, varying with the process. Copies become fainter as run continues. Some machines can handle spirit process as well.
Spirit	40-120	10-400	Facsimile; Xerography	Prints on paper with glossy finish. Variety of colors possible, but purple gives best results. Numerous colors can be run simultaneously. Copies become fainter as run continues.
Stencil	40-200	10 to 10,000	Facsimile; Photocopy (special units)	Copies are possible in any color ink on any color paper. Quick-drying inks permit use of bond and similar papers; other inks require rough paper. Some machines print more than one color simultaneously.

*Speed figures are estimates for letter-size copies, and allow for differences between manual and electric operation, as well as for machine differences. As circumstances vary, figures above or below those listed may be obtained.

**These figures do not represent machine limitations but are based on "practical" considerations such as cost, speed, method of operation, and other factors.

makes masters from stencils, offset, and gelatin processes, as well as single copies. Two models are available for making copies in sizes to 8½ by 14 inches. The machine can copy full-tone, half-tone or line copy at the same time. Price: $2,037.40.

The Western Union Telegraph Co., 60 Hudson St., New York 13. While Western Union's Intrafax equipment is intended primarily for communications, it can make printed copies of typed matter, handwritten matter, sketches, etc. in the process. It can thus be used for single copies, or to make masters for the offset and hectograph processes.

The Duplicating Processes

Diazo

The diazo process utilizes a dye, formed by the interaction of two chemicals, to create the lines of which letters and drawings are made, and thus produce copies. The chemicals are a diazonium salt (or "diazo") and a combining element known as a coupler.

The diazo itself is affected by exposure to light; when it is exposed to light, it can no longer react to form a dye. In the copying process, the letters and lines of the material to be copied actually act as a light shield, so that the diazo is left active where lines and letters are to appear on the copy. This active diazo interacts with the coupler to form the dye.

There are two basic methods used:

In the first method, copies are made on a sensitized sheet, which contains both the diazo and the coupler. These chemicals are prevented from reacting by a third chemical, the "stabilizer."

The material to be copied is placed face up over this sensitized copy sheet, in the diazo machine. A strong ultra-violet light is passed through the original to the sensitized sheet. This light passes through the original wherever there are no lines or letters. Wherever the light passes through the original, the diazo on the sensitized sheet is broken down, so that it cannot react to form a dye when the "stabilizer" is removed.

The "stabilizer" is removed by being neutralized by another chemical. Ammonia is such a chemical. In this first process, the sensitized sheet, after it has been exposed to light, is exposed to ammonia in the form of a vapor.

The ammonia vapor neutralizes the "stabilizer," and the active diazo which remains on the copy sheet combines with the coupler immediately. This produces the desired copy.

In the second method, the sensitized sheet contains only the diazo. The sheet (covered by the original) is exposed to ultra-violet light just as in the first method. It is then brought into contact with a solution containing the coupler. The dye-forming reaction takes place as it does in the first method, producing the desired copy.

The first and second methods have often been referred to as "dry" and "wet," respectively, but these terms are misleading. While the second process does employ a solution, it is applied with a roller, and enough heat is present so that copies emerge, for all practical purposes, dry.

Although, with either method, two

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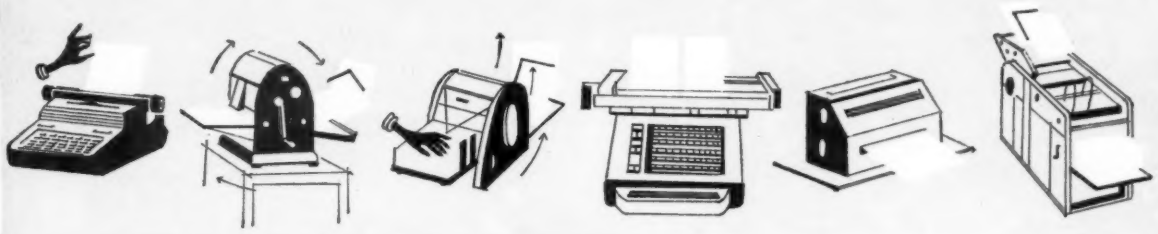

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steps are required for making copies, both are accomplished in automatic sequence within the machine.

The diazo process depends upon light passing through the original to the copy sheet, and therefore will not copy opaque or two-sided originals directly. Most office stationery is translucent enough for the purpose. If two-sided material is to be copied, a translucent copy must first be made. This can be done with photocopy, facsimile, or xerographic equipment. It can also be done directly in some diazo process equipment, using a reflex film designed for the purpose.

The final copies are positives, and may be made on paper of various colors. The printing color may also be varied by an appropriate selection of copy paper. By using hand application of chemicals, it is sometimes possible to obtain different printing colors on the same copy sheet.

Offset masters may also be prepared by the diazo process.

Diazo equipment is usually of the continuous-flow type. Original and copy sheet are advanced mechanically through the various steps. Much of the equipment is designed to handle large-size materials, such as engineering drawings, in some cases, up to 54 inches wide.

Machine speeds vary widely, some operating at speeds as high as 125 feet per minute or more, some as slowly as four feet per minute. Generally, a small model, such as one designed to handle letter-size copies, can turn out approximately 200 copies per hour.

The diazo process is relatively inexpensive. Cost of a typical letter-size copy is estimated at between three-quarters of a cent and one and one-quarter cents.

The Manufacturers

Charles Bruning Co., Inc., 1800 W. Central Rd., Mt. Prospect, Ill. Bruning's Copyflex line includes eleven models, all of which take copy of unlimited length, in widths ranging from 11 to 54 inches, depending on the size of the model. Desktop units can process up to 13 linear feet per minute; the largest model up to 75 feet per minute. The machine can print in several colors; with hand developing, multi-color prints can be obtained. Paper colors available are blue, pink, green, salmon, yellow, and white. Most Copyflex models feature automatic separation of originals from copies. Price range: $555 to $7,800 (F.O.B. Mt. Prospect).

Ozalid, Div. of General Analine & Film Corp., Johnson City, N. Y. The company offers eight models, ranging from the desk-top machine for letter-size copies to large machines which take copy up to 54 inches wide. Operating speeds are from 10 to 100 feet per minute, depending on the model. Price range: $410 to $10,995. Through its subsidiary, Reproduction Products Co., Detroit, Mich., the company offers a machine of the diazo-moist developing type called the Viking, which will accept copy up to 18 inches wide and operates at speeds up to 18 feet per minute. Price: $550. Ozalid is also distributor for the Pelprinter, a portable diazo unit.

Paragon-Revolute Corp., 77 South Ave., Rochester 4, N. Y. The Revolute line comprises four electrically powered models which accept copy in widths ranging from 24 to 54 inches,

P & H "Lancer" dry process machine makes copies at rate of 75 feet per minute

depending on the model, and in unlimited lengths. Speed of operation is 125 feet per minute (optimum). Printing colors available are blue, black, red and sepia; paper colors are white, pink, yellow, green, blue. Price range: $2050 to $10,900.

The C. F. Pease Co., 2601 W. Irving Park Rd., Chicago 18. Pease specializes in large-scale models; smallest machine is 42 inches wide. The firm's "Scout," prints copy up to 45 inches in width and of practically any length, at speeds up to 20 feet per minute. Price range: for the "Scout," $1375 and up; (F.O.B. Chicago) larger models higher.

P & H Sales Corp., (Peck and Harvey Mfg. Corp.), 5650 N. Western Ave., Chicago 45. Seven models are offered, accepting copy in maximum widths ranging from 26 to 45 inches, and of any length. Operating speeds range from 14 to 75 feet per minute, according to the machine. Some models feature automatic separation of original and print; others offer semi-automatic manual separation of original and print.

The Lancer and Arrow models feature "unidirectional separation": small prints are separated from large originals, or vice versa. Price range: $1295 to $5495.

Pelprinter, Inc., 555 Central Ave., Orange, N. J. (See: Ozalid)

Reproduction Engineering Corp., Ivoryton, Conn. (Formerly Peerless Colonial Products, Inc.) Company offers two Blu-Ray models, accepting copy to widths of 22 and 42 inches, respectively, and operating at speeds of up to 4½ feet per minute. Machines are compact, and can be set on table tops. Price range: $257.50 to $287.50.

Technifax Corp., 195 Appleton St., Holyoke, Mass. Five electrically powered and two manually powered models are offered. The largest model prints in widths up to 54 inches, and lengths to 500 yards, at speeds up to 125 feet per minute. The company's newest development is the Slidemaster System which produces diazochrome multicolor transparencies for overhead projection. Price range: $97.50 to $17,500.

Stencil

The stencil process is, perhaps, the best known duplicating method. It has often been called the "Mimeograph" process, after the trade name used by the A. B. Dick Co.

A stencil, the master used in this process, is a sheet of paper, plastic, metal, or other material, in which holes have been made, corresponding to the lines and letters to be reproduced. These holes allow ink, or another printing substance to pass through, thus creating a copy of the original on the paper or other material beneath the stencil.

Conventional office stencils are designed so that letters and lines are not cut completely through the material. This is done so that the centers of

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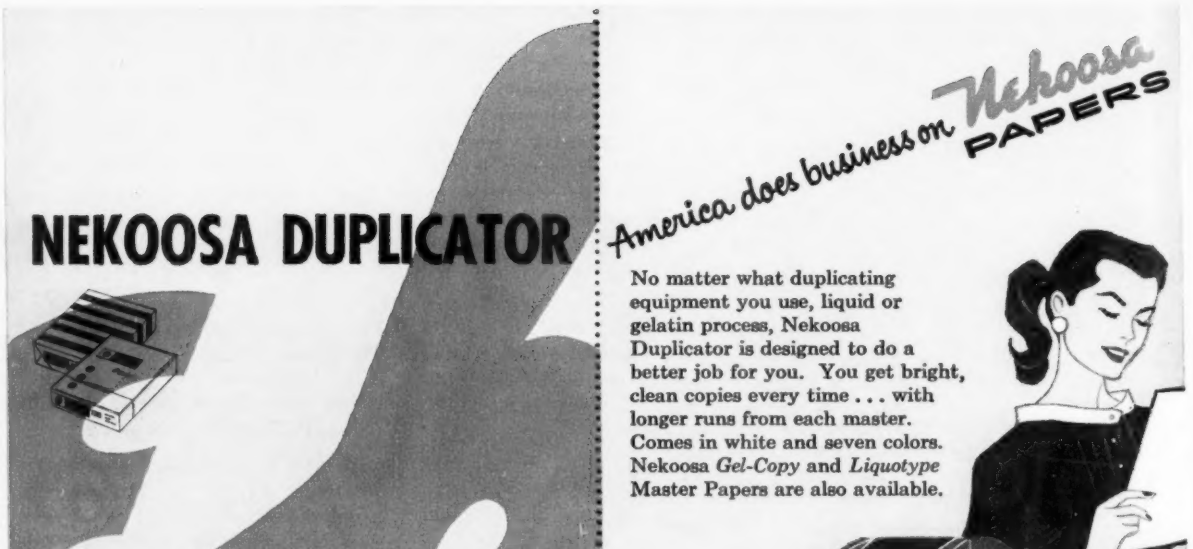
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No matter what duplicating equipment you use, liquid or gelatin process, Nekoosa Duplicator is designed to do a better job for you. You get bright, clean copies every time . . . with longer runs from each master. Comes in white and seven colors. Nekoosa Gel-Copy and Liquotype Master Papers are also available.
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letters, such as "o" and "g" will remain in place.

Usually, the stencil has a fibrous or porous base, through which ink can pass easily. This is covered with a waxy coating, which prevents the passage of ink.

The "cutting" of a stencil actually just pushes aside the coating where lines and letters are to be reproduced. The fibrous base remains uncut as a support for the structure of the stencil.

Stencils may be prepared by hand, using a stylus or other such instrument, by typewriter, by printing with dies, or by such means as the facsimile or photocopy processes. By using either of the latter two means, stencils can be made to reproduce relatively complex material.

Once the stencil is prepared, it is wrapped around the rotating drum of the duplicator, or, if a twin-cylinder machine is used, around the screen which encloses the two cylinders.

Ink comes through the stencil from within the drum or screen. At each revolution of the drum (or each cycle of the stencil on the twin-cylinder type of machine), a sheet of paper is fed into the machine and moves into contact with the stencil. The final copy is made by ink passing through the holes in the stencil.

Ink may be either in liquid or, particularly for use with machines of the twin-cylinder type, in paste form. The paste form, available in tubes, is generally considered cleaner to use.

Copies may be printed in ink of any color, and on paper of any color. While most machines print only one color at a time, it is possible, with some equipment, to print two colors at once.

Copy paper is usually rough, primarily in order to absorb the ink quickly, and thus prevent smearing by successive copies. However, with the newer, quick-drying inks (and/or by slip-sheeting), copies can be made at a satisfactory rate of speed on better grades of paper.

Electrically operated stencil duplicators can generally operate at speeds of 180 to 240 copies per minute. Manual models usually run at speeds ranging from about 60 to 100 copies per minute.

Cost per copy varies with the length of the run, decreasing as the run increases, and with the materials used. In the case of a fairly typical run of 100 copies, cost per copy might be just over a third of a cent; the cost decreases to a much smaller fraction of a cent, if the run is increased to 1000 copies.

A properly prepared stencil, of reasonably good quality, should last through a run of several thousand copies. If special stencils are used (e.g. those of plastic or metal), much longer runs are possible.

The Manufacturers

Bohn Duplicator Corp., 444 Fourth Ave., New York 16. Bohn's BDC Rex-Rotary line includes one electric and three manual machines, all capable of printing a maximum area of 7½ by 14 inches. Machines are of the twin-cylinder silk screen type, and use a cartridge ink supply. Numerous print-

Readers wishing further information from manufacturers of products listed in the Tools of the Office section may use the Readers' Inquiry Coupon on page 102.

ing colors are available, and printing color can be changed rapidly. Feeding and receiving trays close to form self-contained case. Price range: $179.50 to $345.

The Dansen Co., Inc., Box 556, 101 Cooper Ave. No., St. Cloud, Minn. The Dansen Dynagraph is a manual machine, capable of printing a maximum area of 7½ by 10¼. Price: $39.50.

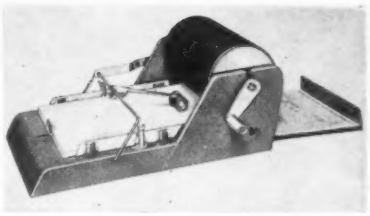
A. B. Dick Co., 5700 W. Touhy Ave., Chicago 31. Dick's Mimeograph line includes six electric and five manual models, all of which will print areas to a maximum size of 7⅞ by 14 inches. Features include automatic inking (and up to 20,000 copies from one inking), automatic feed, pin-point registration, stencils which require no cushions, etc.

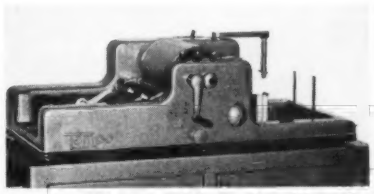
Addo-X Inc., 300 Park Ave., New York 22. Addo-X offers the Roneo line of stencil duplicators, which includes three electric and three manual models. Maximum size of printing area ranges from 8 by 14 inches to 13 by 17 inches, depending on the model. Price range: $230 to $1,250. In addition Addo-X offers the Roneotronic process, available to users of Roneo machines, through Roneo dealers. This process is used to make stencils electronically, and can reproduce, on stencils, photographs, half-screens, etc.

DuPrints, Inc., 1502 S. Main St., Los Angeles 15. DuPrints offers the Dupliroto line, consisting of one electric and one manual model, both of which will print a maximum area of 9 by 14 inches. Prices: $495 and $695.

Gestetner Duplicator Corp., 216 Lake Ave., Yonkers, N. Y. Gestetner offers a line of both manual and electric stencil duplicators of the twin-cylinder, silk screen type, using paste ink. The smallest model will print copy up to a maximum size of 8⅜ by 13½ inches; the largest model has a maximum printing area of 13½ by 16½ inches. Among the features offered are automatic feed, automatic inking, automatic shut-off, and color change equipment. Price range: $240 to $1,298. Gestetner also offers the Gestefax, an electronic-scanning stencil cutter, described in the "Facsimile" section of this department.

Milo Harding Co., 500 S. Monterey Pass Road, Monterey Park, Calif. This company offers four electric and two manual machines, all capable of printing copy up to a maximum size of 8½ by 13½ inches. Machines are of the two-cylinder type, with a plastic carrier screen, and use paste or liquid ink. Among the features offered are a built-in interleaver-collator, accurate registration for second color re-runs, automatic feed, etc. Price range: $211.94 to $874.50.





Danson "Dynagraph" (top) will make 60 copies or more per minute; Milo Harding Tempo stencil duplicator (bottom) uses paste or liquid ink for high speed, heavy duty production.

The Heyer Corp., 1850 S. Kostner

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Whether you work with pen, pencil or machine, if you're doing ledger work you'll do a better job on Nekoosa Ledger. It has the right surface for printing, ruling or writing. It has the strength and durability required in a ledger paper—and comes in white and three scientifically selected easy-on-the-eyes colors.
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Designed for use as the original in the diazo reproduction process, Nekoosa Master-Lucent performs perfectly in Ozalid and Bruning diazo machines. Nekoosa Fax is a brilliant white, bond-like paper designed for use in the Eastman Kodak Verifax copier. Both papers come in cut sizes for office use.

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Ave., Chicago 23. Heyer Lettergraph machines are offered in four manual models, with maximum printing area ranging from 7¼ by 10½ inches to 8½ by 14 inches. The company offers changeable super-pads, for rapid color changes. Price range: $36.57 to $94.87.

Marr Duplicator Co., Inc., 53 Park Place, New York 7. The Marr line comprises three electric and two manual machines, all of which can print copy to a maximum size of 7½ by 15 inches. Machines feature automatic count of printed sheets only, accurate registration for reruns, automatic paper alignment, automatic roller release, etc. Price range: $97.50 to $950.

The Multistamp Co., P. O. Box 1249, Norfolk 1, Virginia. The Multistamp line comprises five manual duplicators of the small hand stamp or rocker type. Maximum size of printed area ranges from 3¼ by ⅞ inches to 7⅜ by 10 5/16 inches. The smaller models are designed for use in direct imprinting on cartons and boxes, or labels and tags. Price range: $9.50 to $44.50.

The Print-O-Matic Co., Inc., 724 W. Washington Blvd., Chicago 6. Print-O-Matic offers a line of stencil duplicators, including both electric and manual models, and a card-size duplicator. Information on current products and prices was unavailable at press time.

Rex-Rotary Distributing Corp., 387 Fourth Ave., New York 16. The Rex-Rotary line includes five electric and four manual machines. Maximum size of printed area ranges from 8½ by 13½ inches to 13½ by 17 inches. The company offers a new lever assembly which makes possible the use of letter, legal or memo-size stencils without masking. The impression roller can be removed rapidly and replaced with a narrow impression roller for printing of narrow paper or post-cards. Price range: $207.40 to $980.50.

Speed-O-Matic Co., 7640 W. Norton Ave., Hollywood 46, Calif. This company offers the Speed-O-Matic postal card stencil duplicator in one manual model, capable of printing in sizes from 3 by 5 inches to 4 by 6 inches. Machine features automatic feed, and impression roller adjustment. Price: $21.95 (includes some supplies).

Speed-O-Print Corp., 1801 W. Larchmont Ave., Chicago 13. Information on current products and prices was unavailable at press time.

Vari-Color Duplicator Co., 435 S. Lincoln, Shawnee, Okla. The Vari-Color line comprises four manual machines, with maximum printing area sizes ranging from 3½ by 5¼ inches to 8½ by 14 inches. Features available include automatic feeding and inking, and accurate registration for reruns. Price range: $16.95 to $99.50.

Weber Marking Systems, Div. of Weber Addressing Machine Co., Inc., Weber Industrial Park, Mt. Prospect, Ill. Weber offers two electric and two manual label-printing machines, and twelve handprinters. Maximum copy sizes range from ⅞ by 2¾ inches to 3 by 7 inches. The label printing machines automatically feed stock in paper rolls, count, cut to size desired, and stack. Label printing machines can convert to rubber plate printing. (SEE:

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"Relief" section.) Price range: hand-printers, $7 to $31; machines, $309.75 to $624.75.

Wolber Duplicator & Supply Co., 1201 Cortland St., Chicago 14. Wolber offers one Copy-Rite stencil duplicator, a manual machine which will print copy to a maximum size of 9 by 14 inches. Features include four-digit counter which registers only printed copies, adjustable stacking guides, automatic pressure roller release. Price: $158.47.

Offset

The offset process, as used in office duplicating equipment, is a simplified version of the printing process known as photo-offset lithography. Like that process, it turns out work of high quality; like that process it is based on the fact that oil (or grease) and water do not readily mix.

To use offset duplicating equipment, a master or plate must first be prepared. This may be made of paper, metal, or plastic. The desired material can be transferred to it with a typewriter (using an appropriate ribbon), or with any writing or drawing instrument which can produce the necessary greasy image. Offset masters may also be prepared photographically, or by such other copying processes as xerography, photocopy, Verifax, diazo, and facsimile.

Whatever the method of preparation used, the resulting image appears on the master in the form of greasy lines, which repel water.

The master is then wrapped around the rotating drum of a duplicator. As the drum rotates, several successive steps occur:

First, the master passes under a roller which applies a light film of water. This water adheres to the background areas of the image, but is repelled by the greasy areas corresponding to the lines and letters of the original.

The master then passes under a roller which carries ink with a special, greasy consistency. This ink is repelled by the water-covered areas of the master, which form the background, but adheres to the greasy areas which represent the lines and letters. The image is now, in effect, written in ink on a water background.

In the third step, the master comes in contact with a third roller, called the blanket cylinder, which is covered with a blanket of rubber. Onto this roller, the master prints the material to be copied. It is this blanket cylinder, rather than the master, that actually prints the image on the copy paper.

This is done in the final step of the offset process. The copy paper is fed between the rotating blanket cylinder and an impression cylinder. The blanket cylinder prints the message on the paper; the impression cylinder presses the paper firmly against the blanket, to insure a clear image.

The action of the blanket cylinder in "offsetting" the ink image from the master to the paper accounts for the name given to this process. It presses the ink into the paper in such a way that clear copies can be made of even such complicated originals as halftones and art work.

Printing can be done in a great variety of colors, and, since the equipment is generally of precision quality, and its registration is exact, copies can be run through several times, when several different colors are desired on each copy.

The offset process is a high-speed

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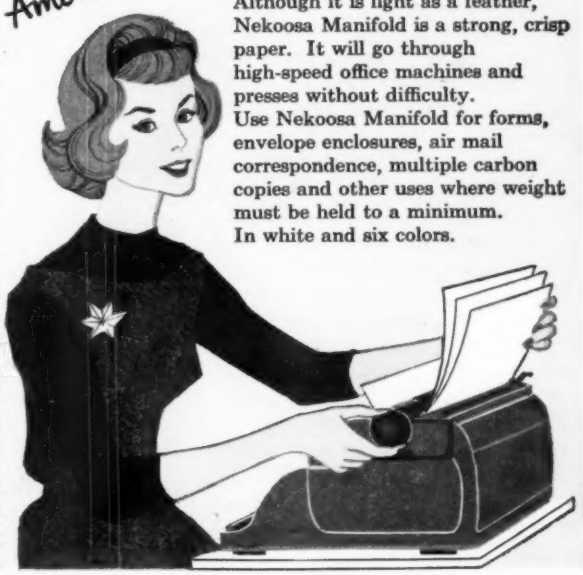

Although it is light as a feather, Nekoosa Manifold is a strong, crisp paper. It will go through high-speed office machines and presses without difficulty. Use Nekoosa Manifold for forms, envelope enclosures, air mail correspondence, multiple carbon copies and other uses where weight must be held to a minimum. In white and six colors.

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A favorite among the nation's leading lithographers, Nekoosa Offset is equally as popular for use on small offset presses. In both color and black-and-white work, Nekoosa Offset always assures faithful reproduction. Feeds through presses fast and smoothly because there is never a curl or wrinkle. In white and eight colors—in a variety of fancy finishes.

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duplicating method. The speed of operation varies with the machine and the materials used, but models, for office use, are available with a designed speed of 9,000 copies an hour. With some weights and qualities of paper and masters, optimum speeds are somewhat lower, but speeds from 4,500 to 8,000 copies an hour are standard.

The process is suited to runs of as few as ten copies, if inexpensive masters are used. On the other hand, with some types of metal plates, it may be possible to obtain well over 100,000 copies.

While offset equipment is more difficult to operate than, for example, a spirit duplicator, new advances in machine design have reduced the skill necessary, by making a number of operations automatic. Among these are automatic moistening of the master when it is first placed on the machine, automatic cleaning of blankets, automatic adjustment of roller pressures to accommodate varying weights of paper stock and masters, and automatic balancing of the ink and water mixture.

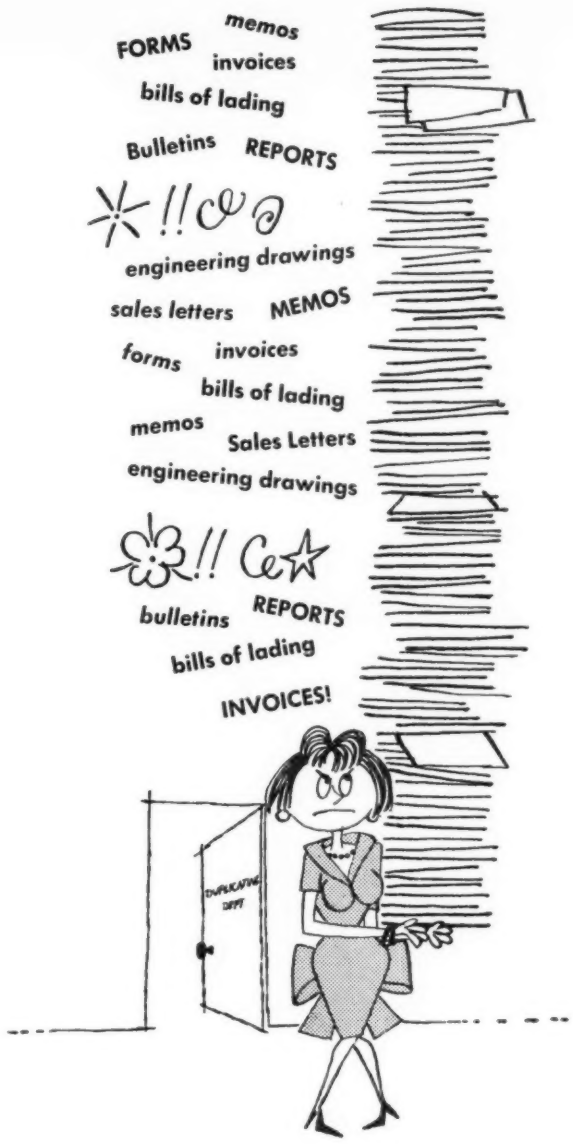
Initial purchase price of offset machines is still relatively high, but the cost per copy, particularly in the case of runs of 100 copies or more is very low: a small fraction of a cent per copy. In the case of runs of 1,000 or more, the cost per copy may be as little as .003 of a cent. Cost figures, of course, vary with the quality of the materials used, as well as with the length of the run.

The Manufacturers

Addressograph-Multigraph Corp., 1200 Babbitt Rd., Cleveland 17. Addressograph-Multigraph's Multilith offset machines (not to be confused with the company's Multigraph relief machines which are described in the Relief Process section of this department) are available in eight models, all electrically powered. Maximum printed copy size ranges from 9¾ by 13 inches to 17 by 19½ inches. Any number of printing colors are available, and on two-headed duplicators, two colors can be run at once. Among features offered are automated feed, double-sheet eliminators, automatic blanket cleaning, etc. Price range: $784.40 to $7,420.

Davidson Corp. (Subsidiary of Mergenthaler Linotype Co.), 29 Ryerson St., Brooklyn 5, N. Y. Davidson offers the Dual Lith line of offset presses and the Dav-A-Matic line of offset duplicators. The Dual Lith line includes ten electrically powered models, with maximum printing sizes ranging from 10 by 14 inches to 14 by 17½ inches, depending on the model. Features offered include automatic feed, delivery, inking, sheet detection, etc. Dual Lith price range: $3,100 to $5,200. The Dav-A-Matic line includes eight electrically powered models, all of which will print copy to a maximum size of 13¼ by 10¼ inches. Eight automatic features are offered, including feed, blanket cleaning, facilities for numbering and perforating, etc. depending on the model. Dav-A-Matic price range: $1,600 to $2,500.

A. B. Dick Co., 5700 W. Touhy Ave., Chicago 31. Dick offers two offset duplicators for general offset work, and five automated offset duplicators, intended especially for highly repetitive systems paperwork. Both types are designed to operate at speeds up to 9,000 copies per hour. Maximum printing area size for both automated and regular models ranges from 9½ x 13 inches to 10½ by 16½ inches. Features include Aquamatic control for assuring the proper balance between



The hardest work with the DAV-A-MATIC is carrying away the output. This low cost offset duplicator is ideal for general office duplicating and adapts perfectly to systems work. Cuts out costly duplication of clerical work . . . *and costlier clerical errors!* Best for every type of printed communications job where *short runs of many different items* are required every day. World's only offset duplicator that changes its inexpensive paper masters automatically, *while the machine is running!* Gives you permanent printing-quality copies, whether you need 10—or 1,000.

With DAV-A-MATIC, office duplicating is a clean operation. No more ink stained hands or clothing. And DAV-A-MATIC is as much at home in the center of your office as it is in your duplicating department!

To streamline your paper work, you really need a DAV-A-MATIC. Write today for the name of your local Davidson distributor—and a persuasive brochure. DAVIDSON CORPORATION, 29 Ryerson Street, Brooklyn 5, New York.

Davidson

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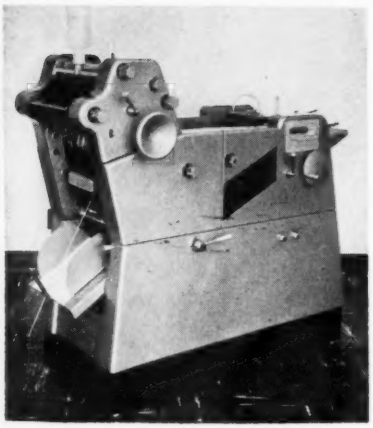

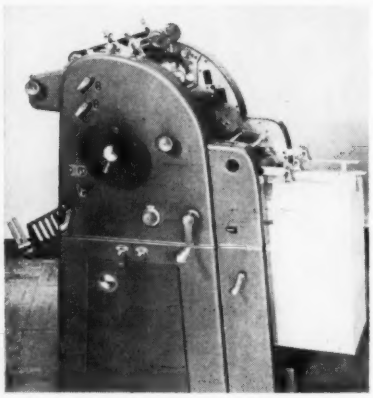

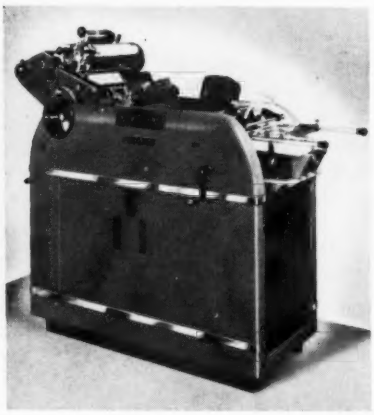

Photostat Corporation's Whitin Masterlith Offset Duplicator (top) features simplified controls for easy set-up and operation. The Masterlith is available in nine standard and some special-purpose models; A. B. Dick Co., Model 360 Offset Duplicator (center) features Aquamatic Control, which maintains constant ink-water balance throughout maximum duplicating run of 9,000 copies per hour. Machine can use magnetic ink, easily read by electronic sorting equipment; Multigraph Multilith Offset Duplicator (bottom) features fully automated feed, start and stop control, blanket cleaner, and double sheet eliminators. Company offers line of eight electrically powered models.

ink and fountain solution, machine cycle and copy count control for routine or specialized duplicating. Machines can use new magnetic ink, which can be read by electronic sorting equipment.

Photostat Corp., 1001 Jefferson Rd., Rochester 3, N. Y. Photostat offers the Whitin Masterlith Offset Duplicator, available in nine standard and several special-purpose models. Paper to be printed may vary in size from 3 by 3 inches to 11 by 17 inches; printed image may vary from a dot to a maximum size of 10⅜ by 16 inches, all sizes depending on the model. On standard models, operating speeds are variable, from 3,400 to 7,200 sheets per hour. Higher speeds available on special order. Features include simplified controls, gripper control of paper throughout printing cycle, jogger-receiver tray, etc. Price range: $3,336 to $4,928.70.

Whitin Machine Works. SEE: *Photostat Corp.* (Photostat handles the Whitin offset duplicator.)

Spirit

The spirit process, sometimes referred to as the "fluid," "liquid," or "liquid hectograph" process, gets its name from the fact that it uses alcohol as a solvent for the aniline dyes with which it prints.

While it is chemically similar to the gelatin process, previously described, it employs a different mechanical system.

As the first step in the process, a master must be prepared, using special paper with a special carbon face-up underneath it. When the material to be copied is typed, written, or drawn onto the master, its image appears on the back of that sheet, in the form of dye transferred from the special carbon. The image, of course, appears in reversed form.

The master is placed around the rotating drum of the duplicating machine. (Some simpler forms of duplicators use a tray on which the master is placed flat.)

As the drum rotates, a sheet of glossy copy paper is fed into the machine, and moistened slightly with a solution containing alcohol. When the paper meets the master, the alcohol solution serves as a solvent, acting to remove a thin layer of dye from the master. This dye is deposited on the copy paper to make the final copy.

As with the gelatin process, each copy is slightly fainter than the one before; however, with a properly prepared master, it is possible to obtain runs of several hundred copies.

The standard printing color is purple, since this generally produces the longest runs and the clearest copies. However, carbons of various colors are available, and a variety of colors may be used on one master, simply by changing the carbon. Copy paper may be of almost any color.

Masters may be prepared by hand, typewriter, standard printing methods, xerography, and facsimile.

Operating speeds vary, and speed of operation has an effect on copy quality. While some equipment may be able to turn out 200 copies per minute, speeds of from 80 to 120 copies per minute are generally considered standard. Manually operated equipment is, of course, somewhat slower. Most is designed to produce copies at speeds of from 40 to 60 copies per minute.

Some spirit duplicators are designed specifically for systems work. Features for this type of use include facilities for operation from a seated position, single-cycle operation (so that different kinds of forms can be printed from the same master, with some information being added or deleted as necessary), and the actual facilities for selecting and adding information.

The process is inexpensive, and the cost per copy decreases as the length of the run increases. For a run of 100, approximate per copy cost is generally considered to be between one-third and one-half a cent.

The Manufacturers

Bohn Duplicator Co., 444 Fourth Ave., New York 16. Bohn offers the BDC Rex Rotary, available in one electric and one manually powered model. Maximum size of printed area is 8 by 14 inches. Masters may be prepared by typing or drawing. Features include automatic master clamp, single sheet feed, trays which close to form self-contained case, etc. Price: $175 for hand model; $275 for electric.

Columbia Ribbon & Carbon Mfg. Co., Herbhill Rd., Glen Cove, L. I., N. Y. This company offers the Columbia Transfer process, which uses standard spirit duplicating equipment, but which is designed to be clean to the touch. It is described in the "Special Liquid" section.

Copy-Craft, Inc., 105 Chambers St.,

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Master Portable Duplicator is manually operated spirit process machine

New York 7. Copy-Craft offers the Ormig line, which includes both straight duplicators and electronic selective data duplicators. Straight duplicators include six electric and three manual models; selective data duplicators include seven electric and one manual model. Maximum copy size ranges from 9 by 14 to 11 by 17 inches, depending on the type of machine and model. Straight duplicators offer such features as automatic clamping device, direct wick moistening device, adjustable pressure control, four-digit counter, separate addressing device, etc. Line includes a systems model which features seated position for operator, front return of copies, etc. Price range for straight duplicators: $79.50 to $1,171.30. Selective data duplicators are made in various models designed to perform specific tasks. The line selection machine permits printing, from one master, without masks, blockouts, second masters or shingled forms: variable headings, fixed headings, and 1, 2, or 3 selected lines, condensing the data onto a smaller form if desired. Column eliminating and shifting machine will print from one master, without masks, etc.: all or part of the heading, and 1, 2, or 3 adjacent columns, condensing the data onto a smaller form where desired. Other machines are designed for other specific tasks. Price range for selective data duplicators: $890.40 to $7,408.73.

Copy-Plus, Inc., 2817 W. Carmen Ave., Milwaukee 9. Copy-Plus offers four electric and eight manual machines. Pacesetter, Curvette, and Unigraph models can print a maximum copy area of 9 by 17 inches. The Ambassador models can print a maximum area of 14 by 17 inches. Masters can be typed, written, or drawn. Price range: $146.48 to $469.48.

A. B. Dick Co., 5700 W. Touhy Ave., Chicago 31. Dick offers four electric and two manual spirit duplicators which can be used interchangeably with the Azograph process, described in the "Special Liquid" section. Maximum printing areas range from 9 by 14½ inches to 11 by 14½ inches, depending on the model. Masters may be prepared using ball-point pen, typewriter, stylus, printing press, addressograph, or tabulator. Features include automatic single sheet feeding system, continuous or intermittent cylinder cycling, adjustable impression roller, etc.

Ditto, Inc., 6800 McCormick Rd., Chicago 45. Ditto offers five electric and four manual spirit duplicators, which can be easily adapted for use with the Chemograph process, described in the "Special Liquid" section. Maximum printing areas range from 8½ by 13⅜ inches to 17½ by 13¾ inches, depending on the model. Masters may be prepared using stylus, pen, pencil, typewriter or tabulator. Some machines feature automatic feed, counting, etc. Price range: $187.25 to $1,325.93.

Duplicopy Co., 224 W. Illinois St., Chicago 10. Information on current products and prices was not available at press time.

DuPrints, Inc., 1502 S. Main St., Los Angeles 15. DuPrints offers the Duplicarbo line of spirit duplicators, including five electric and five manual machines. Maximum printing size ranges from 9 x 14 inches to 19 by 28 inches, depending on the model. The largest size is said to be useful for shipping firms, freight forwarders, exporters, etc. Price range: $169.47 to $995.

The Heyer Corp., 1850 S. Kostner Ave., Chicago 23. Heyer offers the Conqueror line, including two electric and one manual models. Maximum printing size for all models is 9 by 14 inches. Features include automatic start and stop on electric models; masters can be filed and re-used, and information can be added to master for future runs; adjustable feed wheels which grip paper at outer edge, feed-tension control, direct gear-drive counter, etc. Price range: $227.39 to $343.97.

Master Addresser Co., 6500 W. Lake St., Minneapolis 26. This company offers the Master Portable Duplicator, available in two manually operated models. Maximum size of printed area is 8½ by 11 or 14 inches, depending on the model. Prices: $37.50 and $44.50.

Old Town Corp., 345 Madison Ave., New York 17. The Old Town line includes both manual and electric duplicators. Information on current products and prices was not available at press time.

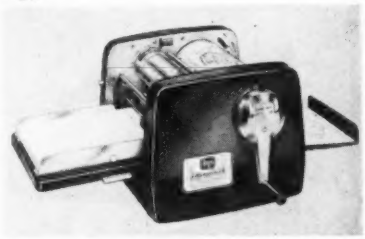
Rex-O-graph Div., General Binding Corp., 1101 Skokie Highway, Northbrook, Ill. The Rex-O-graph line includes four electric and three manual machines. Maximum copy size ranges from 9 by 17 inches to 14 by 17 inches, depending on the model. Price range: $209.88 to $1,038.80.

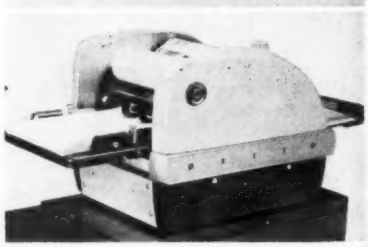
Rex-Rotary Distributing Corp., 387 Fourth Ave., New York 16. Rex-Rotary offers the Fordigraph line, consisting of two manual models, with maximum printing size of 8½ by 14 inches. The machines are portable, equipped with handles; feeding and receiving trays fold up to close the machine. Features include automatic paper feed, resettable copy counter, automatic masterclamp, etc. Prices: $158.69 and $174.65.

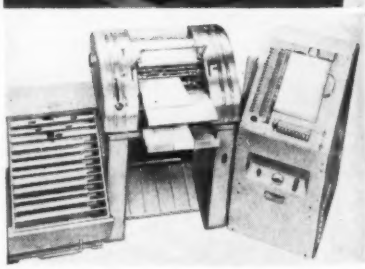
Speedliner Co., 4404 N. Ravenswood

(*To page 74*)

The Heyer Corp., Mark III Conqueror, hand operated spirit duplicator (top) has a maximum printing size of 9 by 14 inches; Ditto D-31 electrically powered spirit duplicator can produce up to 120 copies within one minute, in five different colors; Copy-Craft's Ormig electronic "line selector" duplicator makes possible specific data selection from a master copy







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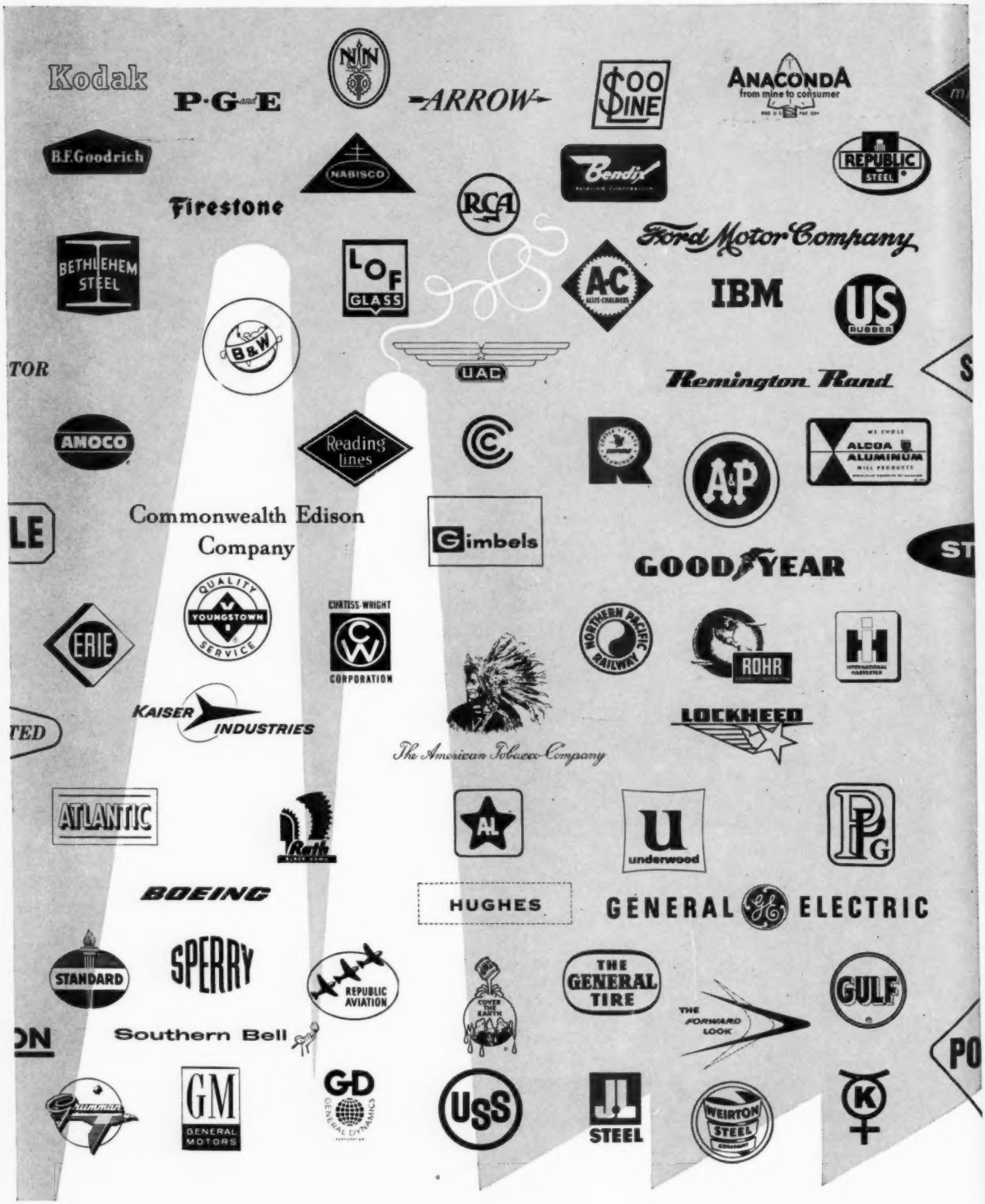

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Ave., Chicago 40. Speedliner offers one manual machine which prints to a maximum size of 8½ by 14 inches. Price: $89.57.

Standard Duplicating Machines Corp., Everett 49, Mass. Standard offers the Starline series of duplicators, capable of handling copy ranging from small finance coupons to 13 by 14 inch sheets. Depending on the model, features include: electronic feed, designed to insure exact registration where hand-feeding and speed are desired; automatic feed, which handles 16, 20, 24 lb. paper stock or duplicator card and tag stock; electric foot switch for automatic operation; "lazy-susan" feature for installations where variable working positions are desired, etc.

Vari-Color Duplicator Co., 435 S. Lincoln, Shawnee, Okla. Two manual spirit duplicators are offered, both printing copy to a maximum size of 8½ by 14 inches. Machines feature automatic feeding and inking. Prices: $76.50 and $99.95.

Wolber Duplicator & Supply Co., 1201 Cortland St., Chicago 14. The Copy-Rite line of spirit duplicators consists of one electric and one manual machine, both printing copy to a maximum size of 9 by 14 inches. Features available include automatic fluid control, five position color control, single control action, which starts current, activates fluid flow and sets rollers in operation, automatic shut-off, and "Margi-Set," which can raise or lower copy during operation. Prices: $210.41 and $317.47.

Special Liquid

The special liquid category includes the Azograph process (made by the A. B. Dick Co.), the Chemograph process (made by Ditto, Inc.), and the Columbia Transfer process (made by Columbia Ribbon & Carbon Mfg. Co., Inc. and formerly called Transograph).

These processes are designed to produce copies with the ease and simplicity of the spirit process, but without the stain problem inherent in that process.

The essential advantage of all three methods is that they prevent the formation of printing dyes until the master is placed on the duplicator and the copy paper is fed into the machine.

In the case of Azograph and Chemograph, this is accomplished by separating two essential chemical agents so that they do not react to form a dye until they meet within the machine.

Tools of the Office

The masters used are prepared by typing or drawing with a special sheet (known as an Azograph transfer sheet or a Chemograph carbon) placed face up underneath the paper. These special sheets take the place of the conventional purple carbon used in the spirit process.

Once the master is completed, it is wrapped around the rotating drum of the duplicating machine, as in the spirit process. As the master is moistened—and not until then—the chemical agents are exposed to each other, and react to form the printing dye. This dye prints onto the paper, producing the final copies.

The Columbia Transfer process uses Columbia Transfer Sets to prepare masters. Like the other two described, this process provides for dye formation *within* the machine. Columbia Transfer Sets are available in a variety of forms, including some which are of the continuous type.

Whichever method is used, the staining problem is solved by not exposing the dyes to the operator's touch.

These processes are intended for the same type of work as the spirit process. In general, they sacrifice length of run for cleanliness of operation; it is assumed that standard runs will not exceed 100 copies by any great margin.

As with the spirit process, copies become fainter as the run progresses and the quantity of dye on the master decreases.

In many cases, the same equipment may be used for both the spirit process and one of the processes described here. Azograph duplicators, for example, handle the spirit process without alteration; older spirit duplicators, however, do not necessarily handle Azograph. Ditto reports that its existing spirit duplicators are easily modified to handle Chemograph. Columbia states that existing spirit process equipment is suitable for use with the Columbia Transfer process.

The Manufacturers

Columbia Ribbon & Carbon Mfg. Co., Inc., Herbhill Rd., Glen Cove, L. I., N. Y. This company offers the Columbia Transfer process, (formerly called Transograph), which makes use of standard spirit duplicating equipment. The use of special masters eliminates the stain problem inherent in spirit duplicating. Columbia Transfer Sets may be prepared by all the methods used for preparing spirit masters. The company, while it does not, itself, produce the duplicating equipment, does provide the Transfer sets required for the process.

A. B. Dick Co., 5700 Touhy Ave., Chicago 31. The Azograph line includes four electric and two manually powered models, any of which can also be used for spirit process duplicating. Maximum printing area ranges from 9 by 14½ to 11 by 14½ inches, depending on the model. Masters may be prepared using ball-point pen, typewriter, stylus, printing press, addressograph and tabulator. Features include automatic single sheet feeding system which feeds paper of substance 16 to 20 and card stock down to and including the last sheet; continuous or intermittent cylinder cycling, adjustable impression roller, etc.

Ditto, Inc., 6800 McCormick Rd., Chicago 45. The Chemograph process can be used on both electric and manual machines offered by Ditto. These are identical with only minor alterations, which can be made easily if desired, to the company's spirit process duplicators. Maximum size of printe area on these duplicators ranges fron 8½ by 13⅜ inches to 13 9/16 by 17½ inches. Masters may be prepared using stylus, pen, pencil, typewriter, or tabulator. Some machines feature automatic feed, counting, etc.

Gelatin

The gelatin process, like the spirit process, makes use of aniline dyes. Both processes are sometimes called "hectograph," the spirit process being distinguished as "liquid hectograph."

While the methods are chemically very similar, they differ in their mechanical arrangements.

In the gelatin process, preparation of a master is the first step. This can be done by typing, writing, or drawing on a hectograph carbon, which is placed face down on top of the master sheet. (In the spirit process, the carbon

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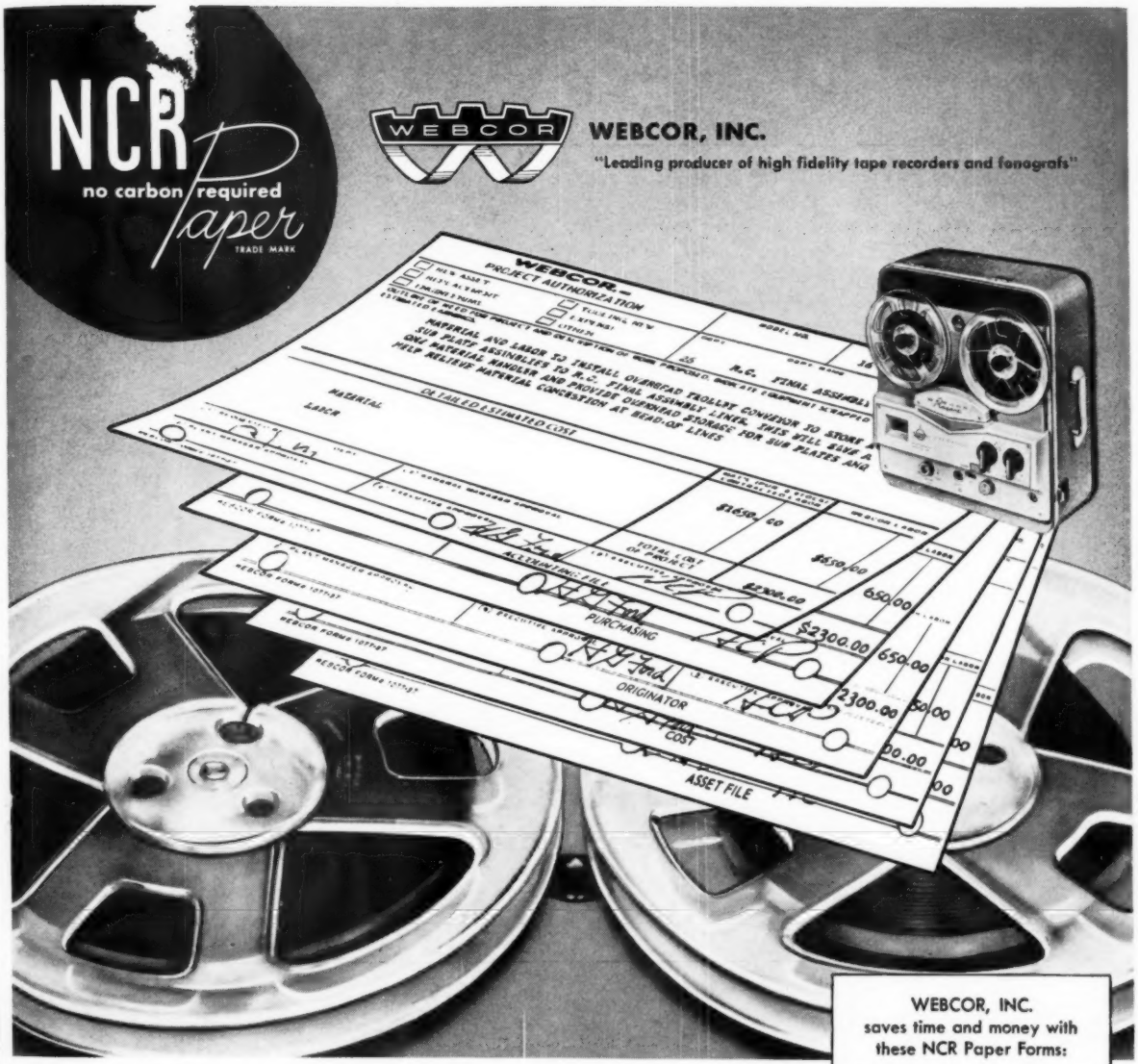

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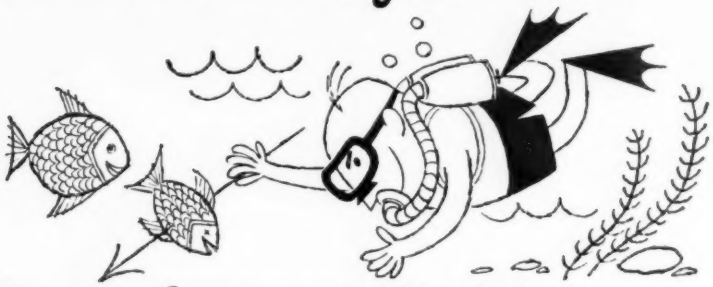

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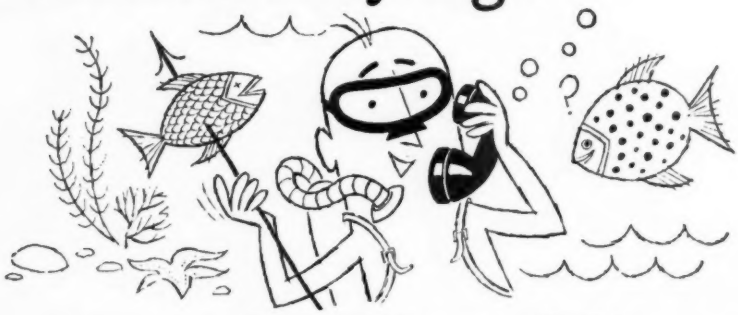

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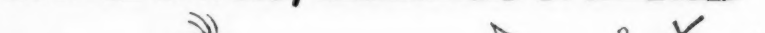

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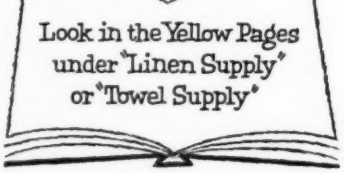

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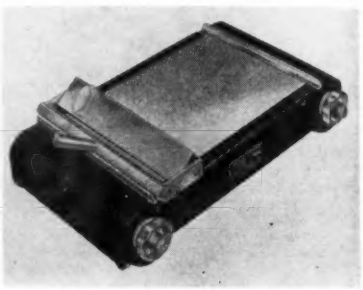
is placed face up *under* the master). It is also possible to type, write, or draw directly onto the master, using a hectograph ribbon, ink, or crayon.

Whatever method is used, the result is a right-reading copy, in the form of deposits of aniline dye, on the master sheet.

The next step is to transfer the image from the master to the gelatin, which is the medium that will actually produce the copies. This is done by placing the master face down on a flat gelatin surface.

The dye is thus transferred from the master to the gelatin itself, which now bears the image of the original in reversed form.



Columbia Ribbon & Carbon's manually operated gelatin roll type duplicator

To make the copies, special high-finished paper is pressed against the gelatin, one sheet at a time, and as a result of the contact, a thin layer of dye is transferred from the gelatin to the paper, thus producing a right-reading copy.

If a flat-bed machine is used, each sheet of paper is pressed against the surface of the gelatin, which is merely stretched across the machine. In duplicating machines with rotary mechanisms, the gelatin is wrapped around a rotating drum, and the paper is fed into the machine.

In either case, the gelatin usually takes enough dye from the master to make from 50 to 100 copies; but as the dye is expended, each copy is slightly fainter than the one before.

Whatever dye is not used up will gradually sink into the gelatin, usually

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Name_____ Title_____

Company_____

Address_____

Use Readers' Inquiry Coupon on Page 102

within a period of 24 hours. The same gelatin can then be used to take the image of a new master. In many flat-bed machines, the gelatin is in roll form, so that a portion of it can be advanced at the end of a run to copy a new master; thus a new run can be made without waiting for the dye to be absorbed by the gelatin.

Copies, as with the spirit process, are usually in purple dye on white paper. Dyes of other colors can be used, and any number of colors may be used on the same master, merely by changing the color of the carbon, ink, or crayon used. However, purple has been found to produce the sharpest copies and the longest runs.

Speed of operation varies from about 10 copies per minute on a flat-bed machine, to as many as 75 per minute with a rotary machine.

In any case, the process is extremely inexpensive, considering not only the cost of the supplies, but the cost of the equipment itself. Per copy costs are measurable in small fractions of a cent.

Next Month:

Air Conditioning Equipment

Tools of the Office

The Manufacturers

Columbia Ribbon & Carbon Mfg. Co., Inc., Herbhill Rd., Glen Cove, L. I., N. Y. The Columbia No. 1 Duplicator is a simple machine, of the flat bed type, manually operated. The gelatin roll accommodates five consecutive master copies, size 8½ by 11 inches. Price of machine: $28.00; roll: $4.41.

The Heyer Corp., 1850 S. Kostner Ave., Chicago 23. The Heyer line comprises eleven manually operated models, which print in maximum sizes ranging from 6 by 10½ inches to 15 by 18 inches, depending on the model. Printing colors available are purple, red, blue, green, black. Price range: $2.75 to $39.50.

Relief

The relief process prints from embossed or raised letters, as does, for example, an ordinary typewriter or rubber hand stamp. The letters may be inked directly, as in the case of a hand stamp, or they may print through an inked ribbon, as does a typewriter. Most machines can use either method.

Relief process equipment, for office use, generally prints from raised metal (or rubber) type, which is set by hand into channels on either a rotating drum or a flat printing head, depending on the design of the equipment.

The type can be changed during a run, so that the method is particularly well suited for printing materials with variable items, such as price lists. To add to its versatility, electrotypes, slugs, signature plates, and other forms of type may be used.

To make a copy, paper is fed between the type (inked by a roller or covered by an inked ribbon) and an impression surface. In the case of a

Readers wishing further information from publishers of books listed in the Tools of the Office section may use the Readers' Inquiry Coupon on page 102.

Smead INTRODUCES ... New FILE FOLDER LABELS

SELF-ADHESIVE in ROLLS (pressroll)

BOX SIZE:
4" x 1¾" x 1-9/16"
WITH REMOVABLE COVER, THIS ATTRACTIVE BOX SUGGESTS MANY RE-USE POSSIBILITIES IN THE OFFICE OR IN THE HOME.

FEATURES
- MARGIN GUIDE FOR UNIFORMITY OF INDEXING ALIGNMENT
- WHITE BACKGROUND FOR MAXIMUM LEGIBILITY
- ROUNDED CORNERS TO PROVIDE EASY SEPARATION
- TYPEWRITER SPACED FOR 1, 2, OR 3 LINE HEADING WITHOUT TYPEWRITER ADJUSTMENT
- COLOR BAR ACROSS TOP PROVIDES DISTINCTIVE COLOR CLASSIFICATIONS
- PRACTICAL LABEL WIDTH 3½" FOR 1/3, 2/5, OR 1/2 CUT FILE TABS

THEY COME TO YOU IN ATTRACTIVE, REUSABLE CLEAR PLASTIC BOXES

Now the neatness and ease of Self-adhesive application
NO MOISTENING OR UNTIDY HANDLING
. . . just press-on

CONTINUOUS FEEDING THROUGH TYPEWRITER FROM A ROLL—NO HANDLING OF SMALL STRIPS OR SHEETS.

Choice of 8 colors • 250 labels on each roll
Perforated for easy separation.

ASK YOUR STATIONER

OR WRITE US ON YOUR OFFICE LETTERHEAD FOR A FREE SAMPLE

Smead MANUFACTURING COMPANY
HASTINGS, MINNESOTA LOGAN, OHIO CHICAGO, ILLINOIS

Use Readers' Inquiry Coupon on Page 102

NEW GUARANTEE! Famous Royal *reliability* is now backed by a unique *one-year guarantee.* Fewer interruptions . . . faster, easier work . . . and lots more of it every day!

MATCHLESS REPRODUCTION! No faint, heavy or jagged characters. You get *perfection* in print every time.

EASIER OPERATION! Exclusive Magic® Margin and Twin Pak®—the instant-changing ribbon fingers never touch—spare muss and fuss, save time and cut fatigue.

FREE TRIAL, BETTER TRADE-IN! Call your Royal Representative for a free demonstration today. You'll find him listed in the Yellow Pages of your phone book. Your old typewriters are worth more than you think in trade.

*CANTERBURY PICA, one of 74 Royal type styles. Pick the one that reflects the character of *your* business.

Now guaranteed for a full year, there are already more Royal Typewriters in office use than any other make.

the business-minded **ROYAL®** *electric*

Product of Royal McBee Corporation, World's Largest Manufacturer of Typewriters.

Use Readers' Inquiry Coupon on Page 102

IN THE UNITED STATES
DISTRICT COURT
DISTRICT OF CONNECTICUT

UNITED STATES OF AMERICA, Plaintiff
v.
PITNEY-BOWES, INC., Defendant
CIVIL ACTION No. 7610

FINAL JUDGMENT

Plaintiff, United States of America, having filed its complaint herein on January 9th, 1959, and defendant, Pitney-Bowes, Inc., by its attorneys, having appeared and denied the substantive allegations thereof, and plaintiff and defendant having severally consented to the making and entry of this Final Judgment without trial or adjudication of any issue of fact or law herein and without admission in respect to any issue:

Now, THEREFORE, before any testimony has been taken and without trial or adjudication of any issue of fact or law herein and upon consent to the parties hereto, it is hereby

ORDERED, ADJUDGED AND DECREED AS FOLLOWS:

I

The Court has jurisdiction of the subject matter of this action and of the parties hereto. The complaint states a claim against the defendant Pitney-Bowes, Inc. upon which relief can be granted under Section 2 of the Act of Congress of July 2, 1890, entitled "An act to protect trade and commerce against unlawful restraints and monopolies," commonly known as the Sherman Act, as amended.

II

As used in this Final Judgment:

(A) "Postage meter" shall mean any device or mechanism, and the component parts thereof, which prints, registers and cancels pre-paid postage on mail matter;

(B) "Mailing machine" or "base machine" shall mean any device or mechanism, and the component parts thereof, used to support or facilitate operation of a postage meter, and to feed, moisten, close and seal or stack mail matter impressed with postage by a postage meter;

(C) "Postage meter machine" means any combination of (i) a postage meter and (ii) a mailing or base machine, which combination may be separable into two or more units or complete in itself when actually operated;

(D) "Existing patent" or "existing patents" shall mean any, some or all claims of the following:

(1) United States and foreign Letters Patent owned or controlled by defendant on the date of entry of this Final Judgment;

(2) Applications for United States and foreign Letters Patent, and any Letters Patent which may issue on any such applications, which applications were filed prior to, and are owned or controlled by defendant on, the date of entry of this Final Judgment;

(3) United States and foreign Letters Patent owned or controlled on the date of entry of this Final Judgment by any person other than defendant and under which defendant on such date has the power to grant licenses or sub-licenses to others;

(4) Any divisions, reissues or extensions of the Letters Patent described in clauses (1), (2) and (3) above;

relating to postage meters, mailing or base machines or postage meter machines;

(E) "Future patent" or "future patents" means any United States or foreign Letters Patent or applications therefor and patents which may issue thereon (exclusive of existing patents), and any divisions, reissues or extensions of such Letters Patent, relating to postage meters, mailing or base machines or postage meter machines, (i) which may be owned or controlled by defendant during a period of five (5) years after the date of entry of this Final Judgment or (ii) under which defendant may, during such period, acquire the power to grant licenses or sub-licenses to others;

(F) "Person" means any individual, partnership, firm, association, corporation or other legal or business entity other than the defendant, its directors, officers, employees, agents or subsidiaries;

(G) "United States" means the continental United States, its territories and possessions;

(H) "Qualified domestic applicant" means any person in the United States certified, in writing, by the United States Post Office Department as meeting the qualifications established by said Department to manufacture postage meters or postage meter machines;

(I) "Qualified foreign applicant" means any person outside the United States who (1) represents, in writing, to the United States Post Office Department, its intention to manufacture, outside the United States, postage meter machines to be used, leased or sold in the United States in accordance with applicable rules and regulations of such Department, and (2) is certified, in writing, by such Department as meeting the qualifications established by said Department to manufacture postage meters or postage meter machines for use, lease or sale in the United States;

(J) "Subsidiary" means a corporation more than 50% of whose stock entitled to vote upon election of directors (other than preferred stock entitled to vote upon the failure of the corporation to pay certain dividends) is, directly or indirectly, owned by defendant:

(K) "Defendant" means the defendant Pitney-Bowes, Inc.

III

(A) The provisions of this Final Judgment applicable to the defendant shall apply also to each of its officers, agents, servants, employees, subsidiaries, successors and assigns, and to all other persons in active concert or participation with such defendant who receives actual notice of this Final Judgment by personal service or otherwise;

(B) Defendant is ordered and directed forthwith to serve a copy of this Final Judgment upon (i) each member of its Board of Directors, (ii) each Vice President who is not a member of its Board of Directors, and (iii) the chief executive officer of each of its subsidiaries, and, within thirty (30) days after the date of entry of this Final Judgment, to file with this Court, and serve upon the plaintiff, an affidavit as to the fact and manner of its compliance with this subsection (B), setting forth in said affidavit the name, position and address of each person upon whom a copy of this Final Judgment shall have been served as herein directed.

IV

(A) Defendant is ordered and directed, within ninety (90) days after entry of this Final Judgment, to file with this Court, and serve upon the plaintiff, an affidavit showing separately, as of the date of this Final Judgment:

(1) The number, and date of issue (or filing, as to applications) and name of owner, where applicable, of each existing patent;

(2) The number, date of issue (or filing, as to applications) and name of the owner, where applicable, of each existing United States patent owned or controlled by the defendant on the date of this Final Judgment.

(B) Defendant is ordered and directed to grant to any qualified domestic applicant, making written request therefor to the defendant, a non-exclusive, unrestricted and royalty-free license to make (but not to have made—except for component parts), use, lease and vend postage meter machines under any, some or all, as the applicant may request, existing United States patents;

(C) Defendant is enjoined and restrained from including in any license issued pursuant to subsection (B) any restriction or limitation whatsoever except that (i) the license may be non-transferable, and (ii) reasonable provision may be made for marking the postage meter machines manufactured, used, leased or sold by the licensee under such license with the number of the patents covering such machines under which the licensee is licensed.

(D) Defendant is ordered and directed to grant to any qualified domestic applicant making written request therefor to the defendant, a non-exclusive and unrestricted license to make (but not to have made—except for component parts), use, lease and vend postage meter machines under any, some or all, as the applicant may request, future United States patents;

(E) Defendant is ordered and directed to grant to any qualified foreign applicant making written request therefor to the defendant a non-exclusive and unrestricted license under any, some or all, as the applicant may request, existing patents and future patents to make (but not to have made—except for component parts) postage meter machines for use, lease or sale in the United States;

(F) Defendant is enjoined and restrained from including in any license issued pursuant to subsections (D) and (E) any hereof restriction or limitation whatsoever except that:

(1) The license may be non-transferable;

(2) A reasonable royalty may be charged, which royalty shall be uniform and non-discriminatory as among licensees procuring the same rights under the same patents;

(3) Reasonable provisions may be made for periodic royalty reports by the licensee to the defendant and inspection of the books and records of the licensee by an independent auditor or any other person acceptable to both defendant and the licensee, who shall report to the defendant only the amount of the royalty due and payable;

(4) Reasonable provisions may be made for cancellation of the license upon failure of the licensee to make the reports, pay the royalties or permit inspection of his books and records as herein provided;

(5) The license must provide that the licensee may cancel the license at any time after one (1) year from the initial date thereof by giving to the defendant thirty (30) days' notice in writing;

(6) Reasonable provisions may be made for marking the machines manufactured, used, leased or sold by the licensee under such license with the number of the patents covering such machines under which the licensee is licensed;

(G) Upon receipt of a written request for a license under the provisions of subsections (D) and (E) hereof, defendant shall advise the applicant, in writing within thirty (30) days, of the royalty it deems reasonable for the patent or patents to which the application pertains. If such applicant and defendant are unable to agree upon what constitutes a reasonable royalty within ninety (90) days from the date the written application for the license was received by the defendant, either the applicant or defendant may, upon notice to the plaintiff, apply to this Court for the determination of a reasonable royalty. In any such proceeding the burden of proof shall be upon the defendant to establish the reasonableness of any royalty requested. Pending the completion of any such court proceeding, the applicant shall have the right to make (but not to have made—except for component parts), use, lease and vend under the patents to which his application pertains without payment of royalty or other compensation, but subject to the following provisions: defendant may, upon notice to the plaintiff, apply to this Court to fix an interim royalty rate pending final determination of what constitutes a reasonable royalty. If this Court fixes such interim royalty rate, defendant shall then issue and the applicant shall accept a license providing for the periodic payment of royalties at such interim rate from the date upon which the applicant requested the license. If the applicant fails to accept such license or fails to pay the interim royalty in accordance therewith, such action may be grounds for the dismissal of his application for a license; in the case of such dismissal, the applicant shall pay any royalties found by the Court to be due to the defendant. Whether or not an interim royalty is fixed by the Court, a final Court determination of reasonable royalty shall be applicable to the applicant for a license from the date upon which the applicant requested such license, and to any other licensee, at its option, then having the same rights under the same patents from the date of such final determination. If the applicant fails to accept a license pursuant to such Court determination, such applicant shall pay any royalties found by the Court to be due to the defendant;

(H) Nothing herein shall prevent any applicant from attacking, in the aforesaid proceedings or in any other controversy, the validity or scope of any of the patents, nor shall this Final Judgment be construed as imputing any validity or value to any of said patents;

(I) Defendant is enjoined and restrained from (i) granting, after date of this Final Judgment, any license or sublicense under any patents to which this Section IV shall apply, except in accordance with, and pursuant to, the terms of this Final Judgment, and (ii) taking, or accepting, after the date of this Final Judgment, any right or license under any patent owned or controlled by any person other than defendant, which right or license is, by its terms or in fact, exclusive to the defendant unless the defendant is also granted the right to grant sublicenses to others;

(J) Defendant is enjoined and restrained from making any sale or other disposition of any patent which deprives it of the power or authority to grant the licenses required by this Section IV, unless the purchaser, transferee or assignee shall file with this Court, and with the plaintiff, prior to consummation of any such transaction, its consent to be bound by the applicable provisions of this Section IV with respect to each patent;

(K) Defendant is ordered and directed, insofar as it has or hereafter may acquire the power to do so, to grant upon written request and without compensation, to any qualified domestic applicant licensed pursuant to this Section IV, with respect to any postage meter machines manufactured in the United States pursuant to such license, a non-exclusive and unrestricted grant of immunity from suit under any foreign patent or application owned or controlled by the defendant at the time of issuance of such license;

(L) Defendant is enjoined and restrained from instituting or threatening to institute any action, suit, or proceedings against any person for use of or any act of infringement of any patent alleged to have occurred prior to the date of this Final Judgment.

V

(A) Defendant, for a period of ten (10) years from the date of this Final Judgment, and upon written request therefor from any person licensed under existing or future patents pursuant to Section IV of this Final Judgment, is ordered and directed to furnish such licensee, for a reasonable charge approximating cost, copies of any technical manuals, books of instruction, drawings, specifications, blueprints, pamphlets, diagrams or other similar documents, which it furnishes generally to its own manufacturing, servicing, repair or maintenance employees relating to the manufacture, repair, servicing or maintenance of postage meter machines commercially produced on the date of this Final Judgment.

Adv

(B) Defendant, for a period of five (5) years from the date of this Final Judgment, and upon written request therefor from any person licensed pursuant to Section IV of this Final Judgment, is ordered and directed to furnish such licensee, for a reasonable charge approximating cost, copies of the patents under which such person is licensed and such of the defendant's technical information as licensee may reasonably need to enable him to utilize the invention or inventions of any of the patents licensed by the defendant to such licensee in such licensee's manufacture, not including, however, the type of documents referred to in sub-section (A) above.

(C) For a period of five (5) years from the date of this Final Judgment, and upon receipt of a written request from any person licensed pursuant to Section IV of this Final Judgment representing that the technical information furnished to such person by the defendant pursuant to subsections (A) and (B) of this Section V is inadequate or insufficient to enable such person satisfactorily to manufacture, operate, maintain, service or repair postage meter machines manufactured under his license from the defendant, the defendant is ordered and directed to make available to such licensee at the expense of the licensee for travel and at reasonable times and for reasonable periods, technically qualified personnel from among its own employees, for consultation with such licensee at the licensee's place of manufacture regarding the licensee's manufacture, repair, servicing or maintenance of postage meter machines. This subsection (C) shall not require the defendant to send any person outside of the United States.

(D) For a period of five (5) years from the date of this Final Judgment, any person licensed by the defendant pursuant to Section IV of this Final Judgment shall, upon written request to the defendant, and at his own expense, be permitted to visit the principal plant of the defendant manufacturing postage meter machines for the purpose of observing, and being advised as to, the methods, processes, machines and equipment then being used by the defendant in its commercial production of postage meter machines; provided, however, that such visits may be restricted as follows:

(1) To not more than 3 officers or employees of the licensee at any one time;

(2) To not more than 4 such visits per year.

(E) The defendant may, as a condition to furnishing the benefits set forth in the foregoing subsections of this Section V, require the licensee, in writing, to agree to maintain any technical information received by such licensee from the defendant in confidence and use such information solely in connection with the manufacture, maintenance, service or repair by or for the licensee of postage meter machines.

(F) In order to accomplish the purposes of this Final Judgment, nothing herein shall be construed to prohibit the defendant from providing, upon terms and conditions not inconsistent with the other provisions of this Final Judgment, to any person requesting it, information or assistance not otherwise provided for in this Final Judgment.

(G) The furnishing by defendant of patent licenses and technical assistance pursuant to the requirements of Sections IV and V of this Final Judgment shall not, in and of itself, create or constitute as to defendant, any guaranty or warranty as to machines not manufactured by it.

VI

(A) For a period of ten (10) years from the date of this Final Judgment, the defendant is enjoined and restrained from acquiring, directly or indirectly, through nominees, agents or otherwise, any of the assets or capital stock of or any financial interest in, any person engaged in the manufacture, sale, distribution or leasing of postage meter machines.

(B) Nothing in this Section VI, however, shall be construed to prohibit (i) acquisition by defendant of all or part of the securities or assets of any of its subsidiaries; (ii) formation of subsidiaries by defendant and the transfer thereto of assets of defendant or of its subsidiaries; (iii) acquisition by the defendant of all or any part of the stock or assets of any agent or distributor of defendant's products, who is not engaged in the manufacture or distribution of postage meter machines not manufactured by defendant; (iiii) application to this Court, at any time after this Final Judgment has been in effect for five (5) years from the date thereof, upon notice to the plaintiff, for permission to acquire any or all of the assets or capital stock of or financial interest in, a person engaged in the manufacture, sale, distribution or leasing of postage meter machines, which may be granted upon a showing by defendant to the satisfaction of the Court, that the effect of any such acquisition will not be substantially to lessen competition or to tend to create a monopoly in the manufacture, sale, distribution or leasing of postage meter machines.

VII

(A) Defendant is enjoined and restrained from, directly or indirectly, entering into, adhering to, maintaining, or claiming any right under, any contract, agreement, understanding, plan or program with any person engaged in the manufacture, sale, distribution or leasing of postage meter machines which:

(1) allocates or divides territories, markets or customers for the manufacture, sale, distribution or leasing of postage meter machines;

(2) fixes, determines or adheres to any price, or element of price, for the distribution, sale or lease of any postage meter machines;

(3) restricts, hinders, limits or prevents such person or any other person from importing postage meter machines into the United States or exporting such machines from the United States;

(4) appoints or designates the defendant as a distributor or agent for the distribution, lease or sale in the United States of postage meter machines produced by any person engaged in the manufacture of postage meter machines;

(5) appoints or designates, as a distributor or agent of the defendant, for the distribution, sale or lease of postage meter machines manufactured by the defendant, any person engaged in the manufacture of postage meter machines;

provided that the foregoing shall not be construed to prohibit defendant from entering into bona fide exclusive distributorship arrangements for designated territories with any person not then engaged in the manufacture or distribution of postage meter machines manufactured by a person other than the defendant.

VIII

(A) Within six months following the ten (10) year period from the date of this Final Judgment, upon application by the plaintiff, the defendant shall show to the satisfaction of the Court that substantial competition then exists with respect to the manufacture, sale, rental and distribution of postage meter machines in the United States. Such competition shall be deemed to exist if persons in each major market area of the United States then have the opportunity, actual and practical in fact, to purchase or rent from other than the defendant on reasonably competitive terms, postage meter machines or devices and mechanisms serving purposes equivalent thereto, under Post Office Department regulations.

(B) If defendant fails to establish to the satisfaction of this Court that such competition then exists, defendant shall submit to the Court a plan, which to the satisfaction of this Court, in light of the conditions then existing, as well as the steps defendant has taken to try and bring about such competition, with full hearing and opportunity for both parties to be heard and present evidence, is designed to bring about such competition as soon as possible. Such plan shall provide for bringing about such competition, in a manner as, by the Court may be deemed necessary or appropriate (1) by substantial assistance to a competitor or potential competitor; or (2) by the establishment of competition by defendant out of its assets, business and properties; or (3) by some other or different method.

(C) Upon such terms as this Court may direct, the defendant may be relieved of its obligations under subsections (A) and (B) of this Section VIII at any time within ten (10) years from the date of this Final Judgment, by (i) applying to this Court, upon notice to the plaintiff, for such relief and (ii) establishing, to the satisfaction of this Court, (a) that a competitor or competitors to the defendant (and in no manner, directly or indirectly, affiliated with the defendant) is or are then actually engaged in the commercial manufacture, sale, rental and distribution of postage meter machines in the United States, and (b) that by reason of the then existence of such competitor or competitors to the defendant, the competition specified in subsection (A) of this Section VIII has then been accomplished.

IX

(A) Defendant is ordered and directed, within ninety (90) days from the date of this Final Judgment, to furnish a true and complete copy of this Final Judgment (a) to the Postmaster General of the United States and (b) to each person who makes written request to the defendant for a copy of this Final Judgment.

(B) Defendant is ordered and directed to cause a copy of this Final Judgment to be published not less than once a month for three (3) successive months after the date of this Final Judgment, in a trade publication of general circulation to persons engaged in manufacturing office machines and equipment.

X

For the purpose of securing compliance with this Final Judgment, duly authorized representatives of the Department of Justice shall, upon written request of the Attorney General, or the Assistant Attorney General in charge of the Antitrust Division, and on reasonable notice to defendant, made to its principal office, be permitted, subject to any legally recognized claim of privilege, (a) reasonable access during the office hours of defendant to all books, ledgers, accounts, correspondence, memoranda, and other records and documents in the possession, custody or control of defendant relating to any matters contained in this Final Judgment, and (b) subject to the reasonable convenience of defendant, but without restraint or interference from it, to interview officers, directors, agents or employees of the defendant, who may have counsel present, regarding any such matter. Upon the written request of the Attorney General, or the Assistant Attorney General in charge of the Antitrust Division, defendant shall submit such written reports with respect to any of the matters contained in this Final Judgment as from time to time may be reasonably necessary for the purpose of enforcement of this Final Judgment. No information obtained by the means provided in this Section X shall be divulged by any representative of the Department of Justice to any person other than a duly authorized representative of the plaintiff, except in the course of legal proceedings to which the United States is a party for the purpose of securing compliance with this Final Judgment, or as otherwise required by law.

XI

(A) Jurisdiction is retained for the purpose of enabling either of the parties to this Final Judgment to apply to this Court at any time for such further orders and directions as may be necessary or appropriate for the construction or carrying out this Final Judgment, for the modification or termination of any of the provisions contained herein, for the enforcement of compliance therewith and the punishment of the violation of any of the provisions contained herein.

(B) Jurisdiction is additionally expressly reserved to enter appropriate orders modifying Section V(A), (C) and (D) hereof, if such orders are consented to by the plaintiff, which consent is not to be unreasonably withheld, with respect to the obligation of the defendant to furnish the technical assistance referred to in Section V(A), (C) and (D) hereof, where the furnishing of same would tend to defeat the objectives of this Final Judgment to assure effective competition between defendant and others in the postage meter machine industry and to avoid undue concentration in such industry. Dated: January 9th, 1959.

(sgd) Robert P. Anderson
United States District Judge

We hereby consent to the making and entry of the foregoing Final Judgment:-

For the Plaintiff:-

(sgd) Victor R. Hansen
Victor R. Hansen
Assistant Attorney General

(sgd) William D. Kilgore, Jr.
William D. Kilgore, Jr.

(sgd) Lewis Bernstein

For the Defendant:-

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Lewis J. Ottaviani

Attorneys for Plaintiff

WIGGIN & DANA

(sgd) Frederick H. Wiggin
Frederick H. Wiggin
a member of the above firm.

Attorneys for Defendant.

Adv.

rotary machine, this surface is an impression cylinder.

If the inked-ribbon method is used, the resulting copy closely resembles typewriting. For this reason, relief process machines are often used to prepare letters or other material in which items such as names and addresses are to be filled in later.

Copies made from type which is inked directly have qualities similar to those obtainable by standard letterpress printing.

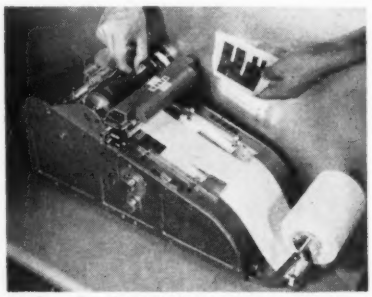
Whichever method is used, the process can turn out work of extremely high quality.

The process is especially well suited for long runs, because typesetting is a rather slow operation, and hardly worthwhile for short runs. Because of the durability of the type, runs of several hundred thousand copies can be made. Using power-driven equipment, average speeds of 6,000 copies an hour may be expected.

Paper colors and weights may be varied through a wide range. Printing colors are limited only by the availability of inks and/or ribbons. Much of the equipment is quite accurate in registration, thus making possible good re-runs in additional colors.

Once the type has been set, duplicating costs are low. Under standard conditions, per copy costs may be less than a fifth of a cent, varying, of course, with the quality of the paper used.

Addressograph - Multigraph Corp., 1200 Babbitt Rd., Cleveland 17. The Addressograph line of Multigraph machines (as distinguished from the company's Multilith machines, which operate on the offset principle and are described in that section of this department), comprises twelve electrically powered and three manually operated models. Maximum sizes of printed area range from 8 by 12½ inches to 16 by 21 inches, depending on the model. Masters may be prepared from loose type, or by electrotype or stereotype. An unlimited number of printing colors are available, any two of which may be run at the same time on a two-headed machine. Features



Weber Dual-80 Label Printing Machine prints 150 labels per minute.

available include a signature attachment, a numbering attachment, perforating, scoring, slitting, etc. Price range: $311.64 to $3,540.40.

Davidson Corp. (Subsidiary of Mergenthaler Linotype Co.), 29 Ryerson St., Brooklyn 5, N. Y. Davidson offers the Dual Lith line, which includes models that can be used for letterpress, as well as for offset work. The line includes ten electrically powered models, with maximum printing sizes ranging from 10 by 14 inches to 14 by 17½ inches, depending on the model. Features offered include automatic feed, delivery, inking, sheet detection, etc. Price range: $3,100 to $5,200.

A. Kimball Co., Rewe St., Brooklyn 11, N. Y. Kimball's Roto Kimco line includes three basic rotary-type models, which may be electrically or manually operated. Machines print from type or logo (rubber or metal, rubber mats or electros). Maximum size of printed area is 4⅜ inches by 2⅜, or by 4¾, or by 6-5/16 inches, depending on the

Tools of the Office

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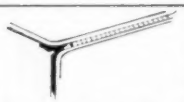

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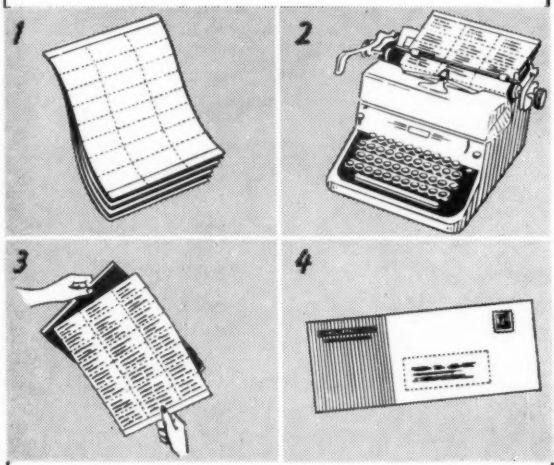

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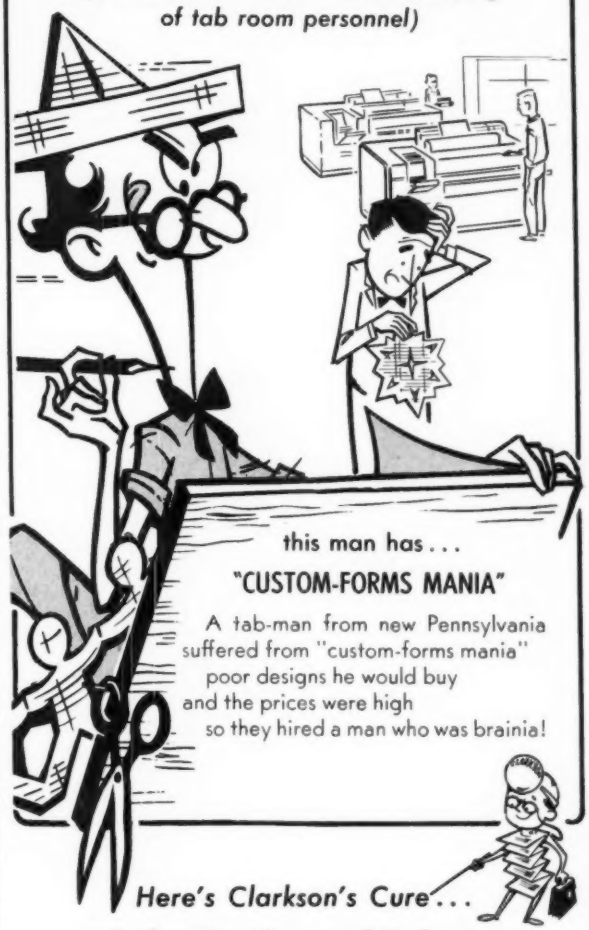
(presented for a better understanding of tab room personnel)



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Use Readers' Inquiry Coupon on Page 102

Tools of the Office

model. Features include automatic feed and registration for reruns. Prices: $750, $850, and $950.

Weber Marking Systems, Div. of Weber Addressing Machine Co., Inc., Weber Industrial Park, Mt. Prospect, Ill. Weber offers rubber plate label printing machines which will print copy in sizes from ½ by 2 inches to 4⅛ by 6 inches, at the rate of 105 per minute. The machines use pressure-sensitive rubber type which can be changed according to the variable information desired, and re-used indefinitely. Machine can convert to stencil printing (see "Stencil" section). Machines can automatically feed stock in paper rolls, count, cut to desired size and stack.

Readers wishing further information from manufacturers of products listed in the Tools of the Office section may use the Readers' Inquiry Coupon on page 102.

Inventory—

(*From page* 25)

simply insure that each branch has enough of the parts it needs at the proper time without having to carry a heavy supply over a full twelve-month period. It can also change the stock level of any given part at any branch if changing conditions in the area served by the branch indicate a heavier or lighter demand than occurred during the previous year.

Basically, the new system is based on individual master controls for each of the thousands upon thousands of parts kept in inventory — individual records for each part which show exactly the quantity on hand in each branch warehouse, in each regional Parts Depot, and in the Master Parts Warehouse for North America at Racine, Wisconsin. Once each month, inventory at each branch for each part stocked there is brought up to the stock level which Central Inventory Control believes to be appropriate for that branch's requirements.

Centralized Inventory Control has been established at Racine, Wisconsin, in conjunction with the Master Parts Warehouse located there. Central Inventory checks each branch's total shipments of parts to dealers once per month, and brings the branch stock level back to the correct level by replacing the disbursements, either from Racine or from one of the Parts Depots.

In essence, that is the new system. In essence, it sounds simple. But, in reality, it is a fairly detailed process, as it would have to be to keep inventories level and adjusted in forty-seven different locations for more than 85,000 different stock items.

The branch replacement flow pattern can perhaps best be understood by following a particular order sequence from branch on through to Racine, and seeing what is done at Racine to insure that the branch disbursements are promptly replaced.

The branch, as it receives orders from its dealers and fills them, makes one copy of each invoice for Central Inventory Control. These are batched daily and sent to Racine by mail. At Racine, the daily invoices from each branch are used to create punched card records of disbursements of parts—the basic record is built on the part shipped out rather than on the branch.

Let's assume that the Massey-Ferguson branch at Springfield, Illinois, ships out to one of its dealers six 60196M1 parts, on an order for quantities of several different parts. This is done on a Monday, and a copy of the invoice sent the dealer is also mailed to Racine, along with all other invoices for all other shipments made that day, Monday afternoon. At Racine, on Tuesday, the invoices from Springfield would

(*To page* 88)

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let a salesman write his own expense checks?

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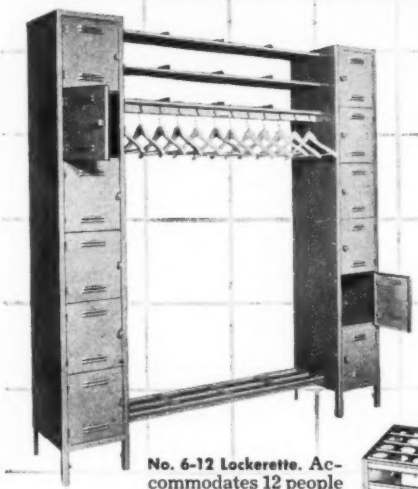
Use Readers' Inquiry Coupon on Page 102

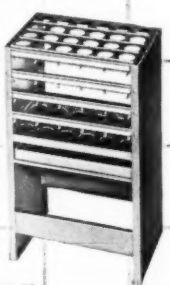
No. 9-18 Lockerette—Capacity: 18 coats on hangers, 18 hat spaces, 18 individual lock boxes and overshoe shelf. Length 9 ft.

The OFFICE VALET Lockerette

Easy to sell because Lockerettes combine the best features of both wardrobe racks and lockers—keep wraps out in the open, aired, dry and in press; provide individual 12" x 12" x 15" lock boxes for personal effects. Easy to sell too because they carry the nationally advertised, universally recognized quality trade mark—"Office Valet"



No. 6-12 Lockerette. Accommodates 12 people on 6'0" x 1'3" floor space.



(Right) These compact, efficient units fit in anywhere. Solve the umbrella problem. Two capacities: 16 or 24.

Write for Catalog Sheets, Dealer Sales Helps, OV-61

104

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So quickly . . . so smoothly . . . in your travel, by modern jet airliner; in your erasing, with Jet Erasers. Bring Jet Age speed and progress right into your office with these *modern* Weldon Roberts Erasers, so wonderfully new and time-saving, so unbelievably clean in use. Handy, business-like, luxury-textured rubber cores in inviting, clear-plastic holders with pocket clips for executives; whisk brush for typists. Holder tip unscrews so eraser stick can be moved outward. Refills, of course.

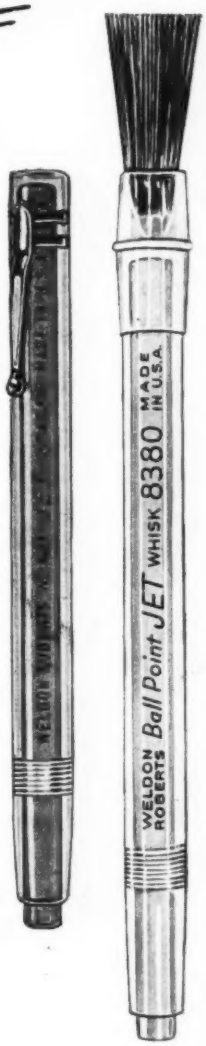
No. 827 Jet
Gray rubber core for erasing ink and typewriting. (No. 8270, with whisk)

No. 838 Ball Point Jet
Green rubber core for erasing ball point ink and India Ink. (No. 8380, with whisk)

No. 825 Jet
Red rubber core for pencil erasing and cleaning. (No. 8250, with whisk)

No. 800 Jet Trio
All three textures with refill for each, in attractive, clear-plastic box.

Ask your stationer for the Jet Erasers (by number above) for the uses you prefer. Write us if he cannot supply you.



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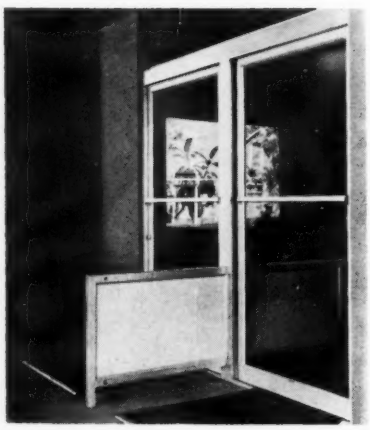
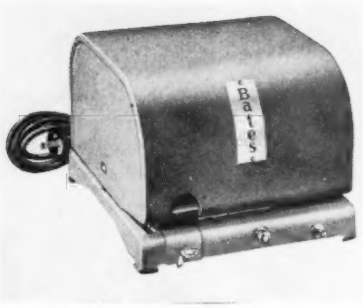


▲ Office entrance **A-1**

Automatic entrance includes door, doorframe, and operating mechanism designed as an integral unit, with the mechanism concealed in the transom. Completely electrical in operation, the doors can also be opened manually by exerting a small force in either direction. *Kawneer Co., Niles, Mich.*

▲ Dual purpose machine **A-2**

"Add-N-Mark," an adding machine that can be converted to a price marking machine, is available in both ten key and full keyboard, electric and manual models with a variety of totaling and listing capacities when used as an adding machine. Both pressure sensitive and gummed labels can be used for price marking, the machine having a marking capacity of $99.99. *Victor Adding Machine Co., 3900 N. Rockwell St., Chicago 18.*



▲ Electric stapler **A-3**

Two interchangeable stapling heads are utilized by the C-H 30 electric stapler: one produces its own staples from a roll of brass wire, and the other uses preformed staples which are capable of fastening up to 100 sheets. The latter head takes three different size staples: one-quarter inch, three-eighth inch and one-half inch. Trigger or foot switches offer alternative methods of operation. *The Bates Mfg. Co., Orange, N. J.*

▲ Photocopy unit **A-4**

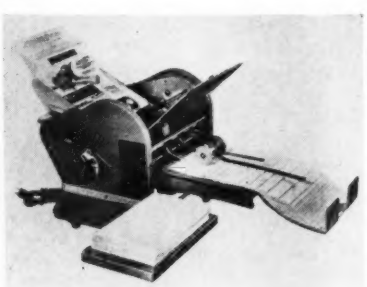
The "Mercury" has a throat width of 15½ inches, a length of 29 inches, a width of 14 inches and a height of 5 inches. An 11-inch document is exposed in three seconds, processed in eight seconds, and, allowing another nine seconds for paper handling, the final copy can be made ready for use in approximately 20 seconds. *Remington Rand, Div. of Sperry Rand Corp.,* 315 *Fourth Ave., New York* 10.

▼ Wall chart **A-5**

Measuring 28 by 40 inches, "Execu-flex" wall chart has a permanent grid which allows for graph or curve charts showing sales or business trends, bar charts for comparative figures and organization charts. All letters, numbers and other materials are pressure sensitive and may be removed as easily as they are applied. *The Chartmakers, Inc., 480 Lexington Ave., New York 17.*

▼ Folding machine **A-6**

Automatic feeding, folding and delivering of sheets up to 9 by 14 inches at speeds reaching 7,200 pieces per hour can be accomplished with the Challenge Fold-Master Unit. A single lever sets up the machine to feed any thickness from 12 to 100 pound stock and up to 5 stapled sheets. *The Challenge Machinery Co., Grand Haven, Mich.*



◀ Tape recorder **A-7**

The Norelco Stereo "Continental" features push button controls, twin tracks for tape economy, and three speeds of 7½, 3¾, and 1⅞ inches per second. The unit consists of tape drive mechanism, two pre-amplifiers with controls, one power amplifier and a wide range speaker with extra powerful magnet. Net price is $229.50. *North American Philips Co., High Fidelity Products Div., 230 Duffy Ave., Hicksville, L. I., N. Y.*

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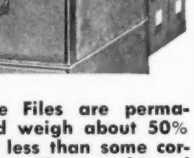

CONVOY, Inc.
STATION B, BOX 216-O
CANTON 6, OHIO

Inventory—

(*From page* 25)

go immediately to the tabulating department, which would punch IBM cards for each line of each invoice—that is for each of the different types of parts shipped by Springfield to its dealers the previous day. Thus, a single punched card record would be created for the shipment of six 60196M1 parts the previous day. Each card would also have information punched into it covering the quantity shipped, the branch which shipped the parts, and the date on which the parts were shipped.

These cards, punched daily, are accumulated for each branch over a period of a month; the branches are restocked on a staggered time basis. Let's assume that the Springfield branch disbursement records had been accumulating for nearly the full period when the punched card record had been created for the six 60196M1 parts shipped. The record has been created on Tuesday; we'll say Thursday is the day when Springfield's total disbursements over the month are to be checked, and the Springfield stock level brought up to date.

On Thursday, then, all the cards that have been accumulated for each day's shipments of each part from Springfield during the preceding thirty days are pulled from the file, as are the same punched card records for two other branches. The cards for all three branches are now run through a tabulator which transfers summary information on total disbursements of each part for each of the three branches during the month to a listing. At the same time, summary cards for total disbursements of all parts for all three branches over the period covered are created as a by-product. These cards are the basis of sales control records for the company.

Data posted to control cards

The listing, which carries the summary information on total disbursements for each part from each branch in legible as well as coded form, now goes to Central Inventory Control at the Racine office. There the information appearing on the tape is posted to Master Inventory Control Cards for each of the parts recorded on the tape.

The posting process is carried out by a sequence of clerical stations, each of which is responsible for maintaining Master Inventory Control Cards for approximately 2,500 parts. (Parts for which previous worldwide yearly sales have been less than 25 are not carried in branch inventories, and orders for such parts are handled on a special order basis.)

The taped information on disbursements from the three branches flows through each station in each line, and each station brings its records up to date on the parts for which it is responsible, if any disbursements of those parts are recorded on the tape. Each station also takes action to bring branch stock levels back to the desired quantity for each of the parts for which the station is responsible.

Heart of the system is the Master Inventory Control Card for each part. The Master Inventory Control Card is a form showing each of the 47 branches in which parts stocks are kept. Vertical columns for each branch are sub-divided into "In", "Out", and "Balance" sub-columns. Each branch column is ruled off horizontally for the twelve months of the year.

As the tape carrying the record of

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Use Readers' Inquiry Coupon on Page 102

all parts shipments for the three branches processed each day flows down the line, each clerk takes from it information concerning shipments of any of the parts designated by numbers in the range for which he is responsible. Let's assume the tape carrying Springfield monthly disbursements has now reached the clerk responsible for records on all parts numbered from 60050M1 to 62300M1. He pulls the master cards for each part number within this sequence that appears on the tape record.

As he reaches the card for 60196M1, he enters in each vertical column representing the three branches whose stock replenishment needs are being processed the total disbursements from the branch of part 60196M1 during the month. Since the vertical column for each branch is divided horizontally by months, he has in the same column a record for the previous month of how many 60196M1 parts were shipped by the branch, how many were replaced from Racine or a subsidiary Parts Depot, and what the closing balance was for the branch stock.

Each branch automatically restocked

Let's narrow it down to the Springfield branch again. Springfield is shown on the tape to have shipped a total of 32 60196M1 parts during the time period covered by the tape. Perhaps during the previous month, the Inventory Control Card shows that Springfield started with a balance of 100 units, disbursed 30, and was shipped 30 by Racine, bringing its balance on hand back to 100. A glance at the figure at the head of the Springfield column shows that 100 is the correct predetermined stock level to be maintained at Springfield on part 60196M1.

During the month just concluded, Springfield, by selling 32 units to dealers, has brought its stock down to 68. Shipment of 32 60196M1 parts from Racine will bring the balance on hand back to the desired level—100.

In essence, this is the process by which branch stocks are automatically replenished, without the need for elaborate record-keeping at the branch. However, there are further subtleties in the system that have been developed to keep inventory levels even more fluid. Basically, each branch is supposed to have on hand a supply of every stock item large enough to meet its requirements for six months.

Thus, the basic stock level figure entered at the head of each vertical column on each inventory control card represents the quantity of the particular part represented by the card which that branch is supposed to have on hand—six months' supply. The six-month figure is determined on a basis of one-half the previous year's sales of the particular part through the branch.

But one of the major disadvantages of the old system, in which branches were responsible for determining their own stock levels, and had to make their own predictions concerning demand levels, was the difficulty of anticipating heavy or light demand conditions far in advance. Different machines are used at different times during the agricultural cycle, creating varying demands for the parts used in each machine. But sowing and harvesting times, too, can vary according to the weather. Moreover, if a farming area changes its major crop from one year to the next, heavier part replacement demand can be expected for machines used with the new crop than the previous year's figures would indicate, and lighter demand for parts used in the machines required for the previous year's crop.

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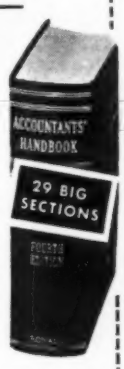

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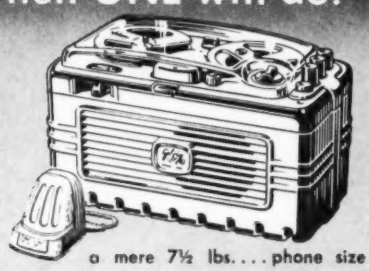

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Thus, while the figure at the head of each branch column on the Master Inventory Control Card represents 50 per cent of the previous year's sales at that branch of the particular part covered by the card, the clerk does not always bring the branch balance on hand back to exactly that figure. If the particular part is in the "fast moving" category, is a part which sold in quantities, worldwide, of more than 200 the previous year, he may vary the basic figure according to percentage allotments given him by the Central Inventory Manager. These percentages of the basic six-month stock are determined on the basis of the best predictions Racine can make on demand levels in the areas served by each of its branches.

Thus, although previous year's sales of 60196M1 through Springfield may have been 200, so that the basic Springfield stock level should be 100, the Inventory Control Manager may have specified that for this particular month 130 per cent of normal stock for this particular part should be maintained through all midwestern branches, since the time for heaviest use of the machine in which the part is used is arriving. Under these circumstances, Springfield—and all other midwestern branches—would be sent enough units from Racine to bring its balance of 60196M1 to 130 per cent of normal supply.

Stock reduced after peak demand

As the period of heaviest use of the machine passes, Springfield and the other branches would be brought back to normal stock level through Racine's replacing only enough units to give each branch the desired stock quantity.

Similarly, the Inventory Control Manager can adjust stock levels to meet anticipated demand changes stemming from farmers in any given area planting acreage for a crop different from that grown the previous year.

With his instructions as to whether to replenish branch disbursements to the normal level, or to some level above or below normal in mind, the clerk responsible for 60196M1 determines the exact quantity of the part each of the three branches should have in stock. He then makes out a "Replenishment Form" for the part for those three branches, indicating the quantity of 60196M1 that must be shipped to each to bring its stock up to the desired level. He brings his master inventory control card for 60196M1 up to date by entering the total disbursements of the part from each of the three branches being processed, the balance left in each branch after the shipment, and the quantity he is ordering to be shipped to each branch via the Replenishment Form.

Associated with Master Inventory Control Card is the Master Parts Warehouse Inventory Control Card, which shows stocks of the particular part on hand at the Master Parts Warehouse at Racine, and in each of the regional Parts Depots. The stock replenishment may be made from any of these sources to particular branches, but the central records are still handled at Racine, and Racine always determines which facility shall re-stock the branch. It may even, in a case where one branch needs replenishment, and another one nearby has accumulated an overstock of the required part, order the second branch to ship to the first. No matter where the replacement stock is shipped from, however, all administration of

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the movement is handled at Central Inventory Control in Racine, and all records of the movement, and resulting changes in stock levels are kept there.

After the clerk has completed the Replenishment Form for each of the branches being processed, it goes to a filing section which has a stock of cards pre-punched for each of the parts — by part number and name — maintained in inventory, and their warehouse location. Quantity to be shipped to each of the three branches processed daily, and branch designation is punched in on cards representing each of the parts being sent out to replenish branch stock levels.

The completed punched cards are used to create automatically all necessary orders, shipping papers, and records for the warehouse at Racine, or one of the Parts Depots. The "package" of papers is sent off to whichever warehouse is to fill the replenishment order, and within a matter of hours the flow of parts needed to bring stock levels at the three branches back to normal has begun.

Now what does the Massey-Ferguson centralization of all inventory control functions at Racine mean in terms of improving the basic customer service the company can offer?

Long equipment breakdown avoided

It means that the farmer who is the ultimate consumer can be assured, when he buys a Massey-Ferguson product that, if it needs parts replacements at any time, he can have it serviced in a matter of a few days at most. Under the old system, if the branch which supplied the customer's dealer had made a mistake in predicting the quantities of parts it would need for the year's period, the machine which required the part might be out of service for weeks—and a two-week delay in sowing or harvesting can make all the difference in the tight timing of the farmer's work year between a good year and a bad one. A two-week delay was unusual, but it was not unheard of — and is not unheard of today in many agricultural equipment lines. When the branch parts manager was responsible for his own stocks, there was no central record anywhere of precisely what supplies were available at any given point.

Thus, if Branch A ran out of a part for which it had orders, it first had to determine which factory in the company made that particular part, and then query the factory warehouse. If the particular factory concerned was in Toronto, and the branch in Jacksonville, some delay was, of course, inevitable. But in instances where the factory warehouse, too, did not have a supply of the needed part, then a real delay occurred. Yet, even while the frantic search continued, a branch not two hundred miles from Jacksonville might have an oversupply of the needed part.

Such delays were the exception rather than the rule, perhaps, but they were common enough to make it difficult for a dealer to assure his customers of exactly how long it would take to replace any required part. But under the current Massey-Ferguson system, all dealers handling the com-

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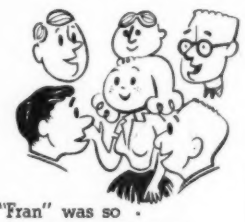

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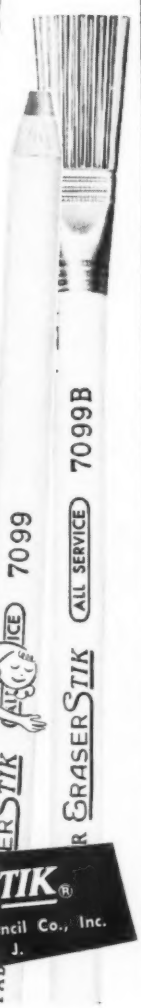

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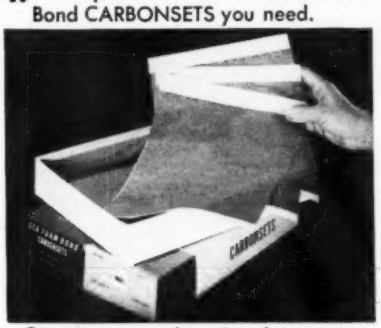

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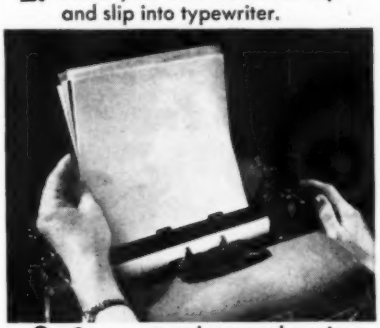

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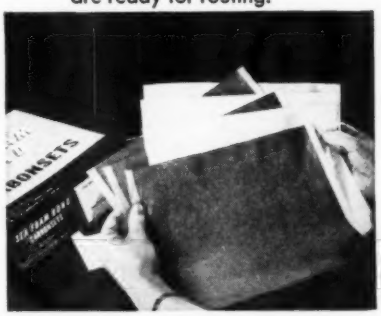

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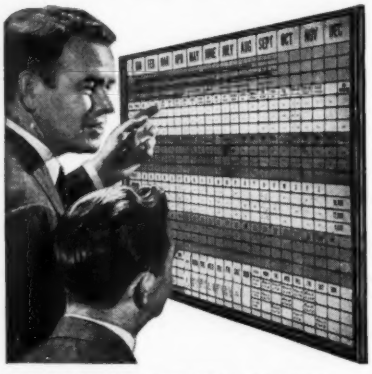

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GRAPHIC SYSTEMS

pany's products will be given master lists showing just which parts have "stock item status", and so are available through the branch; just which have "special stock item status", and are available only through some branches (although such parts can still be obtained, if the dealer's branch does not carry the item, through the nearest Parts Depot); and those which are on "non-stock item status", and can only be supplied from Racine or a Parts Depot.

Thus, a dealer can tell a customer who needs a spare part exactly how long it will take before the part is delivered. If there is a real crisis, and the part is urgently required, but the branch does not carry it, the dealer alerts the branch to the need for quick action. The branch teletypes Racine, which can, if necessary, send the part directly to the dealer by air.

In cases like this, when "non-stock" items are ordered, and it is necessary to ship directly from Racine to the dealer, copies of the shipping order are sent from Racine to the branch supplying the particular dealer, so the branch may bill the dealer as it would for items sent from its own stock.

Thus, the whole process makes it possible for a dealer not only to be certain of being able to meet a customer's needs according to a definite time schedule; it also enables him to give especially fast service when that is required. He could be sure of neither under the former system.

New plan part of reorganization

The new plan of Centralized Inventory Control has been put into effect during the past nine months as part of a general reorganization throughout the Massey-Ferguson organization. Many of the company's manufacturing activities are also being centralized: Racine was formerly the site of a Massey-Ferguson factory, which is being closed down. Racine manufacturing activities are being transferred to Toronto, the company's headquarters, and the factory buildings at Racine are being converted for warehouse use. Studies made by the Massey-Ferguson organization showed that Racine was within a few miles of the geographical center of farm equipment transhipment activity in this country, and so, since the company was already established there, it was the logical place to locate the Centralized Inventory Control Function and Master Parts Warehouse. Since agricultural equipment is not subject to customs duties, transferring manufacturing activities from Racine to Toronto did not handicap the company in any way in United States sales.

Much of the flexibility of the new system derives from the fact that it can anticipate dealers' needs for parts, and therefore the stock level required for parts in its branches, much more accurately and on a much shorter time lead than branch personnel were able to do in the past. Thus, Central Inventory Control at Racine can insure that any branch is prepared for abnormally heavy or light demands simply by raising or lowering the basic stock level for each part in the branch on the monthly replenishment order.

Obvious, perhaps—but how does Racine determine whether demand will be heavier than last year's, lighter, or the same, for any given part?

In the first place, it can work on a short time lead. In the past, in order to set up factory production schedules, branch personnel were required to estimate all their year's requirements in advance. These requirements for each part were totalled; a production run was made for this total, plus a factory warehouse reserve, and that

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was that. Now with centralized inventory control, parts production is run on a continuous basis, and production schedules can be adjusted on the basis of orders from one point — Racine. During this first year of operation under the new system, the Racine Master Parts Warehouse based its requirements on 130 per cent of 1957 sales for each part, but as exact sales figures for 1958 are worked out, varied warehouse reserve totals will probably be established for different parts.

Central Inventory Control, then, can make predictions of parts needs in each of its branches on the basis of a sixty-to-ninety day time lead in comparison with the twelve month forecast that was formerly needed. And it has a force of five field operations personnel who serve as its eyes and ears on developments which affect agricultural operations in all parts of the country. Constantly traveling through the branches, and, with branch personnel, visiting the dealers, these men send back reports to Racine outlining just what acreage farmers in each part of the United States and Canada are putting into various types of crops, how much land they are holding back from cultivation, just what weather conditions augur for the crop, etc. On the basis of such reports, the Central Inventory Control Manager at Racine, can refine the basic stock level figure for each item at each branch, adjusting it above or below the standard established on the previous year's sales figures.

Thus, the newest developments in systems techniques, and rapid processing of information are being enlisted to aid the oldest of man's pursuits — agriculture. Through careful, scrupulous planning, the farmer's capital equipment — his machines — can be protected against long and costly break-down just as completely as can industry's.

AMA —

(*From Page* 32)

and More Potent Uses of Computer Power," presented by Alan O. Mann, Commercial Coordinator—Computers and Automation, Government and Industrial Division, Philco Corp., Philadelphia. Second talk on the Wednesday morning schedule will be a discussion of "A Practical Continuous Management Inventory System," by Herbert Seidensticker, assistant controller, Combustion Engineering, Inc., New York. Closing talk of the morning session will be on "Computer 'Simulations'—Guides to Dynamic Marketing Strategy." The speaker will be Patrick J. Robinson, coordinator, Marketing Research, Imperial Oil, Ltd., Toronto.

The afternoon session on Wednesday, the closing day of the conference, will cover "Bridging the Gap Between Computer Technology and Methodology," "Which Comes First — The Streamlined Report of the EDP System?" and "Application of a Computer to Bank Accounting." James T. Scott, assistant manager, Electronic Data Processing Dep't., Union Carbide Corp., New York, will cover the first subject; Jules Mersel, manager, Operations & Data Processing Dep't., Computation & Data Reduction Center, Space Technology Laboratories, Hawthorne, Calif., the second; and B. W. Taunton, First National Bank of Boston, the third.

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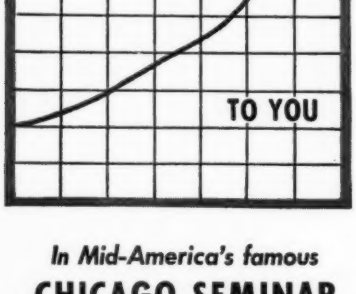

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Brazil—

(*From page 33*)

time, all of which added up to many minutes of extra waiting.

The depositor did not bring his check directly to the teller, as we do in America. He brought it to a counter. The clerk, or "balconista" behind this counter examined the check for date and to see if the written amount corresponded to the numerical amount. He then tore off the stub of the check and gave it to the depositor. This stub (on the right hand side of the check) contained a printed serial number which was also printed on the check. When the check was ready to be paid, this number was called.

The depositor, knowing that the payment of his check would ordinarily take quite some time, took a little stroll around the block. After all, he could always put his time to good use by looking at the passing senhoritas.

From the counter, the check went to the desk of the chief of the section. If it was over three hundred dollars, he personally examined the signature. These checks remained on his desk until he had time to look at them. All the checks under the maximum amount were placed in a file box and he rang a bell for an office boy—or "continuo." The continuo brought the check to the signature section. Although this section was only three feet away, it was not the function of the signature clerks to get up and get the check—only to examine signatures.

These "Conferentes de Assinatura" looked up the signature in a Kardex file. If the signature could not be read, an account number, stamped on every check (a different number than the serial number previously mentioned), was looked up in order to find the correct name. If everything was in order, the check was stamped, initialed, and placed in a file box ready for the office boy to pick it up.

The continuo took the check from the signature section and brought it to the account card clerks—the "municiadores." This section was four feet away from the signature section. The function of the municiadore was to find the account card and check the balance. He would then place the check and account card on his desk for the office boy to bring to the posting clerk, three feet behind the municiadores. (It was difficult to decide whose patience was tried the most—the client's or the office boy's.)

The office boy brought the account card and check to the posting clerk—the "mecanografo." This man made the posting and gave the check and account card to his examiner—the "Conferente de Lancamentos." The check was examined, the posting verified, and the check given to the office boy to take to the teller for payment. The account card was given back to the account clerks. The teller called the number, and, if the depositor had completed his stroll, the check was paid.

One doesn't have to have twenty-twenty vision to see the faults in this system. But we had a difficult time convincing the management of the bank that faults existed. After all, their system had been in use for decades, and, although, come to think of it, there had been many complaints, every bank in Brazil used this system, so what was wrong with it?

This argument is not peculiar to Brazil. Many companies in America use it. "After all, we've been doing it this way for twenty years—why should we change?"

One of the ways we used to convince the Brazilian bank that there was a good reason for changing their system was to poll the depositors and ask them whether they wanted their checks paid faster. Naturally, the answers were in the affirmative, and we explained to the bank's management how their depositors would increase if a new system were adopted. Thus was the seed of the revolution born when the management began to have visions of a new golden era.

After making a detailed study of their system and the work of the individuals who processed the checks, we knew that, based on the volume and the time necessary for each activity, many employees had much free time during the day. Using this information as a base, we changed their old system by combining the functions of three people—and giving all three functions to the clerk at the counter.

Instead of the signature clerks waiting for a check to be brought to them, we stapled all the signature cards to the account cards. We eliminated in toto the function of those employees examining the signatures and the balances. We moved the account cards, with the signature cards attached, close to the counter.

With these simple changes, when the depositor presents his check to the clerk at the counter, this clerk turns around to the file of account cards placed immediately behind him, examines the signature and the balance, stamps his verification on the check, and brings the check and the account card to the teller. The depositor is paid immediately and the posting is then made.

Bankers skeptical of plan

We presented this new procedure to the bank's management in great detail, with flow charts of the new and old systems, a written procedure, and a verbal presentation which assured them that our new system would not only take less time but also reduce the number of employees necessary for the processing of the checks. However, we were working in the State of Minas Gerais which corresponds roughly to our state of Missouri. They wanted to be shown.

We went ahead, therefore, and installed our system in a representative branch. Although the new system was, basically, very easy to operate, we had many problems before it worked properly. We had to sell everyone on the advantages of the new system — from the manager of the branch down to the lowest clerk. In Brazil, as in America, each worker is an individual. It is a prime necessity to convince these individuals that new ideas are good ideas. They are going to have to work with this system and they want to be sure that it will work for them. As we did with management, we used our flow charts and explained the system and each individual's part in the system in great detail.

Finally, the system was accepted by everyone and was put into operation. Everyone was impressed by the rapidity with which checks were being paid, but the manager felt that his counter clerks had too much to do. The counter clerks felt the same way. They complained that the "Americano" had installed an assembly line operation.

The truth of the matter was that we had taken work from one individual, given it to another, and in effect, said, "Here, you don't have enough work to do anyway." If this had been done in America, we would have gotten the same reaction. This reaction was minimized by giving each of the counter clerks a sizable raise.

In addition, in order to convince everyone that we were not increasing the work load to an insupportable point, we made a complete time study of all their new activities. We recorded the volume of every day and every hour of the day. We recorded the time necessary for each activity, breaking down each operation into its necessary elements.

We came up with statistics which showed that, in spite of their complaints about the increased work load, this work load could be handled by one less counter clerk in the morning and one less in the afternoon.

This obstacle overcome, our revolution proceeded without impediment and we began to install our new system in all of the bank's branches. Other banks slowly became aware that there was a new method to simplify check payments, increase depositors, and reduce costs, and we have been receiving inquiry after inquiry. The trend is now quite evident—conservatism in banking circles in Brazil is being replaced by a knowledgeable modernism — just as in America.

Viva o revolucao!

Decision-making—

(*From page* 31)

This machine language is mostly numerical.

The nice part about it is that the machines don't care what the numbers represent. They can mean money, quantity, item classification, or purple people eaters. The machine will act upon them as instructed regardless. Now, let's reduce this concept to more specific terms.

Let's refer back to our second hypothetical case, the simple routine decision. The customer was to be charged freight costs if the invoice amount was under fifty dollars. Let's get under the cover of our computer now and see what happens.

Just as in a conventional adding machine, the components of our computer will include a series of counters capable of adding, subtracting, multiplying and dividing. In billing an invoice the computer will automatically follow a program of instructions which, among other things, will set up the amount of the total in one of the counters. Another component of the machine, a comparing unit, will take the amount set up in the counter and automatically compare that amount

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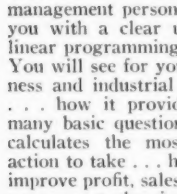

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against fifty dollars. If the reading is plus, it will mean the order is over fifty dollars; if the reading is minus, the order will be under fifty dollars. And *automatically,* the proper action will be taken by the machine.

This will relieve clerical people of the necessity to look up the amount of the invoice and add the freight manually when they decide this is necessary.

Let's proceed a step further to our third hypothesis, where freight will be charged on orders under fifty dollars provided certain conditions do or do not exist. In this case all the conditions would be set up in advance in the "memory" unit of the machine. They will be set up in machine language, or code. Digit "1" may mean key account; sales areas 15—25 may be designated strategic; the digit "5" may mean PM merchandise. Here again, when the machine senses these identifying codes, proper action regarding the freight decision will be automatically taken, relieving clerical personnel of the function.

Check man-hour savings

Consider the significance of this procedure. How many people are used by your company to make routine decisions? How many man-hours are spent? How quickly and efficiently are the decisions made? What is the cost involved?

These are the questions to be answered before a decision can be made regarding the economic feasibility of switching such functions to automated equipment.

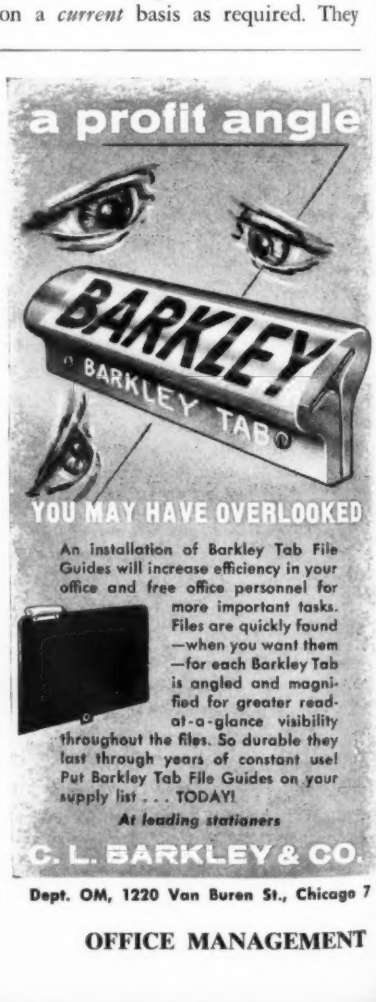
Let's now consider briefly the problem of the supervisor with the bossy, hard-to-get-along-with employee in his hair. His decision is a human one, and, amazing as they are, computers have not yet been invented that can evaluate personality traits, or tone down a neurotic wench. Unfortunately this decision will have to be made without the help of automation.

What about the supervisor's boss, however, the Director of Sales & Research with the pricing problem on his hands? Can he be helped by automation?

Here again the answer is no. But this time it's a qualified no. Computers have one thing in common with the conventional adding machine. They're both short on instinct. Neither machine can relocate itself in a woman's brain, especially a woman out shopping for a hat. This does not mean, however, that pricing decisions couldn't be reached faster and more accurately through the aid of a computer.

In order to make this decision, as previously stated, the executive will need certain vital statistics. He'll need an analysis of past sales of similar items, items comparable in cost, design, appearance, fashion appeal. He'll need reports on business conditions. A knowledge of these reported statistics coupled with the executive experience, instinct, and business know-how, will combine in his mind to produce the decision regarding the price of the new item.

A large part of this needed information is translatable in terms of numbers. Item, location, style classification can all be coded numerically. Quantities and dollars and cents are numerical to begin with. Here is what our computer has been waiting for. Numerical information can be processed faster and more accurately by machines than by people. Assuming that the amount of business volume warrants the cost of the equipment, historical and statistical reports can be obtained on a *current* basis as required. They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can be produced to show specific information on a selective basis.

The concept of management-by-exception is gaining increased importance in the field of business. No longer is it necessary for busy executives or their aides to wade through reams of insignificant detail to isolate the handful of facts needed to run the business. Machines can be programmed and set up to perform this screening process in advance. Minimum and maximum levels can be established internally, the equipment geared to indicate exceptions only — as in an inventory application where high and low stock conditions must be pinpointed for management.

With statistical information made available so much more quickly and dependably, the executive's day can be devoted more to the creative aspects of his job. Time spent in poring over long reports will be minimized. Most important, information not previously available because of excessive cost or time factors can now be extracted to help management with its decisions.

Wherever a situation can be translated in terms of numbers or numerical conditions, highs, lows, minimum requirements, maximum requirements, etc., the decision involved can be machine made. Not only is this practical economically, it is also instrumental in relieving much of the tedium of clerical labor. In the long run it will mean more time for the now-not-so-hectically-busy executive to practice that old fashioned art of sitting and thinking.

Checklists—

(*From page* 28)

Let's say, for example, that we have to select a photocopy machine. Before we start, we spend a few minutes listing the specific things we want to know about it. This isn't so hard. There are quite a number of things that will apply to absolutely any machine whatever, so they never take long, and quite a few other questions will come to mind about photocopy machines specifically. The charm is that it doesn't matter too much if one forgets some significant feature: if it's really basic, the first salesman one sees will mention it. If it isn't vital to performance it will still probably come up with at least one of the machines, and then one can always check back quickly to see whether the other most promising brands have it too.

The result of these efforts might be something like the list shown in Fig. 1.

Now we are prepared for our first salesman, who comes in next morning. Here is where we start saving time. No long spiel to get down to the point. We have ten specific questions, and we want specific answers. Then he can tell us anything else he wants about the machine — so long as the sales talk is specific, concise and to the point. We may want a demonstration, but nothing vague and general: it has to prove the specific points already made. After this, the checklist will probably look something like Fig. 2, but it will have pinned down a lot of hard facts.

This tactic has several advantages— it makes it obvious to the salesman that there is no time for a lot of general sales talk; it gets specific features and guarantees on record, so that he realizes the machine and the supplier must live up to them; and it helps to develop the checklist until, after a few such interviews, it is likely to be pretty complete.

"A bit rough on the salesman," one might think. But this isn't really so.

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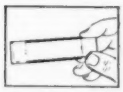
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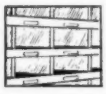
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If he has the best product, he will get the order. Keeping the conversation specific saves his selling time as well as the potential purchaser's time: that's to his advantage. And since machines differ, if he doesn't get this order, he knows that he has had the opportunity to mention all the specific features of his machine, and that they are on record. When the next application comes up, if one of the features of his machine makes it the most suitable for this job, it won't be overlooked. Also, if he doesn't get the order, there will be very specific reasons why not—reasons he can learn, if purchasing policy allows — and do something about, perhaps. He would certainly prefer that to a vague explanation that, "Well, we liked so-and-so's machine better."

After this first check, the checklist will probably require some editing: there will probably be extra features to add; and these become specific questions to keep the interviewer in the saddle for that much more of the next salesman's visit, again in the interest of saving as much time as possible.

Of course, one has to be careful not to reveal to any salesman competitive data that a previous one would not want revealed. The transaction isn't finished when the machine has been bought: continued good relations are important for good after-sales service, to be quite hard-headed about it, even if one isn't concerned with the principle of the thing. For this reason, it is probably better to keep the lists for individual machines on separate forms, rather than on a spread-sheet. The spread-sheet might have to be rather wide anyway, and so would become unwieldy. One can always staple the forms side-by-side ("shingled") to make a comparison.

Each checklist may finish up running to more than one page. The one we started might develop into something like the sample shown in Fig. 3.

Perhaps all this still does not sound too convincing. It sounds like a lot of work for just one type of machine, and there are so many types.

But once the list is made, it is a permanent record. Next time there is a need for a similar type of machine, even if it is for a rather different job, the work won't have to be done over again. All that is necessary is a quick check with the various suppliers to see whether they have any new features to offer. This done, the new selection can be made, on the basis of data just as complete and up-to-date as it was when the list was first made out.

To build a series of lists like this for all the various types of equipment available may seem an enormous undertaking — but let's analyze the apparent difficulties for a moment.

To start with, all the lists don't have to be prepared at once, or even within any given time limit. They can be done if and when it's necessary to review a particular kind of machine (or furniture or other piece of equipment for that matter—the same approach works just as well) for an immediate purchase. But the point is, that once having recorded the data in this systematic way, next time the problem comes up it is much easier to solve. And, perhaps more important, no one can challenge the fairness of the method, or its likelihood of turning up the best machine for the job. This in itself is worth a fair amount of trouble.

There is one caution to sound in this last connection. Perhaps the most important "feature" about any par-

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ticular piece of equipment is how it performs in daily use. This is one part of the checklist that can't really be checked with the vendors, and one that should definitely not be omitted. This means, of course, contacting other users, but any reputable supplier will willingly supply their names, so this is not too difficult.

Another thing: There do seem to be an enormous number of different pieces of equipment on the market, but they do fall into a very finite number of classes; and within those classes — adding machines, calculators, bookkeeping machines, and so on — a number of makes will be ruled out at the start for one reason or another (except in the very largest cities): no local agent; poor local service arrangements; and so on. This reduces the undertaking to manageable proportions. After all, one has to be more or less familiar with what is available, so why not be systematic about it?

Then again, collecting the data on features offered by the vendors does not require an expert. It is a simple tabulation of data that can be carried through by anybody with a reasonable grasp of what is wanted; only the assessment of the relative values of the various features on different machines needs the expert's time.

At that stage, too, the checklist approach has definite advantages. There will be a considerable number of basic features in which the various makes of a given machine seem equally reliable. Again, picking out and tabulating the features where there is a noticeable difference is not a job demanding any long experience. Yet, when it is done, there is all the relevant data, served up "on a plate" to the man who has to make the decision.

This information might be presented in the form shown in Fig. 4. All that then remains is to evaluate it. And much of this evaluation can be done by someone lacking any very considerable experience. Features that this particularly applies to are those which offer savings of cost: differences in cost of supplies, for example; or performance differences which offer savings of time, which can easily be converted into cost savings. Samples of how this sort of thing might work out are shown in Fig. 5.

Overall cost indicated

All that then remains is to assess the value of the differences that can only be regarded as intangibles. This does demand experience, but it is always a tricky problem and, in any case, the checklist approach does help to reduce the number of features that must be studied in this way.

That done, we're home. The selection is obvious. In the unlikely event of a tie, the order may go to the salesman who is most persistent, or most personable, or most helpful. But the checklist method makes sure that a choice for this reason is a conscious one, not just a result of general impressions, that all factors have been considered, and this one is the logical one to tip the balance.

What is better, it not only helps to make the selection as objective as is humanly possible: it makes it obvious that it is so.

But more important than any of these factors: low first cost is often a strong selling point. In default of other information on costs, it will often be the decisive one. The checklist approach makes it certain that the cost considered is the expected real cost of using the equipment throughout its useful life. It insures, in other words, that the company really does get the best buy.

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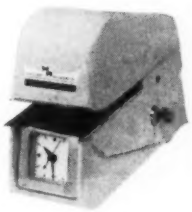

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He will take an interest in our multi-million dollar business. He will turn big ideas into big money for himself. He will be his own boss and operate his own business. Are you THE MAN? Write me in complete confidence. President, Workman Service, Inc., 320 N. Dearborn St., Chicago 10.

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Now you can hear every word clearly over the phone—even right next to a noisy machine. Burgess-Manning "HEAR-HERE" Booths are acoustically designed to provide an "isle of quiet" in the noisiest place. Ideal for manufacturing areas, hotels, stores, depots, shipping rooms, etc.—a model especially suited to each location.

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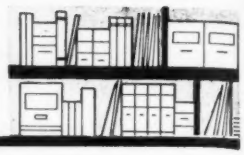

Steel office furniture (1)

Columbia-Hallowell Division, Standard Pressed Steel Co., Jenkintown, Pa., #2443. An eight page, full color pamphlet depicting Columbia executive, secretarial, and side chairs in seven styles. Major construction and design features are reviewed.

Photocopying procedures (2)

Statmaster Corp., 19 W. 44th St., New York 36. Three models of an all-in-one photocopying unit are displayed and operational procedures for making a variety of photo prints and negatives are outlined.

Improving letterhead quality (3)

Neenah Paper Co., Neenah, Wisc. *Two Sides To Your Business Letterhead,* is a twelve page booklet suggesting methods for improving letterhead quality without additional cost. Statistics and sample letterheads are included.

Shipping room equipment (4)

Seal-O-Matic Dispenser Corp., 169 Murray St., Newark, N. J. New catalogs are offered illustrating tape dispensers, label moisteners, and a variety of shipping room tools and equipment.

Streamlined sales forms (5)

Baltimore Business Forms Co., 3132 Frederick Ave., Baltimore 29, Md. *Extra Time For Selling,* is a pamphlet concerning the use of simplified sales forms and records, designed to increase sales efficiency. Call reports, quotation, expense account, order, and other forms are illustrated and described.

Stencil duplicating equipment (6)

Milo Harding Co., 500 Monterey Pass Rd., Monterey Park, Cal. Tempo catalog listing over three hundred, fifty Tempo stencil duplicating products. A variety of items are illustrated including Temposcopes, and stencil filing systems.

Water coolers (7)

Cordley & Hayes, 443 Fourth Ave., New York 16. #59. This twenty page catalog describes a complete line of electric water coolers giving capacity data and technical details for each.

Punched card reports (8)

Royal McBee Corp., Westchester Ave., Port Chester, N. Y. Brochure #S-503 outlines five business reports which can be created from Keysort marginal punch cards. The reports cover profit and loss, daily labor, weekly cost recovery, weekly load and excess, and plant operations.

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WANTED ALL TYPE OFFICE Machines, Filing Equipment, Office Furniture, Karadex, Acme Post Index. Will exceed a manufacturers' trade-in allowance. Write, Wire National Office Equipment Co., 429 Broome St., New York, N. Y.

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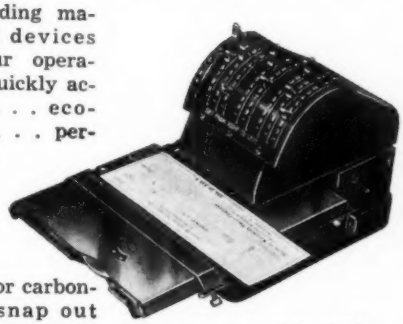

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This service is provided for the convenience of Office Management Executives in obtaining complete information on the products advertised in this issue. Advertisements are identified by their respective page numbers. Fractional page advertisements are further identified by the initials of the advertiser.

Simply circle the respective numbers in coupon below

Just circle the numbers on which you want further information; fill in your name and address below, tear out and mail to Office Management. Our office will forward your inquiries promptly to the companies concerned.

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Please forward to the respective companies, our request for further information on the items we have circled below. There is no obligation to us for this. We understand this is a service to us as a subscriber.

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4	41	63	84	96 CLB
6	42	64	85 VPC	97 EAC
7	43	65	85 WRR	97 VFI
8	44 CC	66	88 CI	98 CC
9	44 AFC	67	88 CSI	98 CPC
10	45	69	89 TRP	98 DEC
11	46	71	89 AGE	99 BBC
12	47	73	90 WAF	99 HRM
13	48	75	90 OM	99 WSI
14	49	76	91 AWF	100 BMC
15	51	77	91 BPC	100 ALC
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19	55	80	93 CCS	103
	57			

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3	A-3
4	A-4
5	A-5
6	A-6
7	A-6
8	

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Information on products listed in the Tools of the Office section may be requested by writing in names of manufacturers.

Manufacturers	Page No.

Name.....Title.....

Company.....

Address.....

City.....Zone.....State.....

Number of Office Employees (all departments).....

March 1959 Issue
Office Management
This inquiry form good until April 15, 1959

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Acco Products Div. of Natser Corp. 95
Agency—La Porte & Austin, Inc.
Acme Visible Records, Inc. 13
Agency—E. H. Brown Adv. Agency
Ajax Business Machines, Inc. 101
Agency—Frederick S. Oliver Adv.
American Geloso Electronics, Inc. 89
Agency—Byrde, Richard & Pound
American Photocopy Equipment Co. ..39, 40, 41
Agency—Irving J. Rosenbloom & Assoc., Inc.
American Telephone & Telegraph Co. 3
Agency—N. W. Ayer & Son, Inc.
Anken Film Co., Inc. 44
Agency—Industrial Marketing Services Co.
Associated Business Publications, The 87
Avery Label Co. 100
Agency—Martin R. Klitten Co., Inc.

Bankers Box Co. 99
Agency—Frank C. Jacobi Adv., Inc.
Barkley & Co., C. L. 96
Agency—Frank C. Jacobi Adv., Inc.
Bell Telephone System 3
Agency—N. W. Ayer & Son, Inc.
Brownville Paper Co. 91
Agency—Flack Adv. Agency, Inc.
Burgess-Manning Co., Architectural Products Div. 100
Agency—Merchandising Advertisers, Inc.
Burroughs Corp. 22
Agency—Campbell-Ewald Co.

Can-Pro Corp. 98
Agency—Geer-Murray, Inc.
Cel-U-Dex Corp. 98
Agency—The Powerad Co.
Clarkson Press, Inc. 83
Agency—Lloyd Mansfield Co.
Columbia Ribbon & Carbon Mfg. Co., Inc. 8
Agency—E. M. Freystadt Associates, Inc.
Comptometer Corp. 12
Agency—MacFarland Aveyard & Co.
Control Systems, Inc., Plus Computing Machines Div. 88
Agency—George V. McIntyre Adv.
Convoy, Inc. 88
Agency—Rex Farrall, Inc.
Copease Corp. 42
Agency—Anderson & Cairns, Inc.
Copycat Corp. 44
Agency—Feeley Adv. Agency, Inc.

Davidson Corp. 67
Agency—Hazard Adv. Co., Inc.
Dewberry Engraving Co. 98
Ditto, Inc. 69
Agency—Fulton, Morrissey Co.

Eagle Pencil Co. 11
Agency—Batten, Barton, Durstine & Osborn, Inc.
Eastern Fine Paper & Pulp Div. of Standard Packaging Corp. 73
Agency—Smith, Hagel & Knudsen, Inc.
Eastman Kodak Co., Business Photo Methods Div., Verifax 48, 49
Agency—J. Walter Thompson Co.
Economics Press, Inc., The 77
Agency—Carpenter-Proctor, Inc.
Edison Voicewriter Div., Thomas A. Edison Industries 9
Agency—J. Walter Thompson Co.
Electronic Accounting Card Corp. 97
Agency—James R. Fox Adv.
Esterbrook Pen Co., The 6
Agency—Young & Rubicam, Inc.
Eureka Specialty Printing Co. 83
Agency—Kretschmer & Dinner, Inc.

Faber-Castell Pencil Co., Inc., A. W. 91
Agency—J. M. Kesslinger & Assoc.
Faber Pencil Co., Eberhard 14
Agency—Anderson & Cairns, Inc.
Force & Co., Inc., Wm. A. 90
Agency—Philip I. Ross Co.

General Pencil Co. 103
Agency—Maxwell Sackheim & Co., Inc.
Globe Wernicke Co., The ..... 4th Cover
Agency—Strauchen & McKim Adv.
Graphic Systems 92
Agency—Diener & Dorskind, Inc.

Haloid Xerox, Inc. 51
Agency—Hutchins Adv. Co., Inc.
Hammermill Paper Co. 55
Agency—Batten, Barton, Durstine & Osborn, Inc.
Heller Roberts Mfg. Corp. 99
Agency—George I. Bushfield
Howard Paper Mills, Inc. 53
Agency—Kircher, Helton & Collett, Inc.
Hunt Pen Co., C. Howard 101
Agency—Doremus-Eshleman Co.

International Paper Co. 57
Agency—Ogilvy, Benson & Mather, Inc.
Interstate Metal Products Co., Inc. 82
Agency—Raymond Heer & Assoc.

Linen Supply Association of America & National Cotton Council 76
Agency—George H. Hartman Co.
Ludwig, Inc., F. G. 46
Agency—Moore & Co., Inc.

McGraw Edison Co., Voicewriter Div. 9
Agency—J. Walter Thompson Co.
McGraw-Hill Book Co., Inc. 96
Minnesota Mining & Mfg. Co., Thermo-Fax 10, 52
Agency—Erwin Wasey, Ruthrauff & Ryan, Inc.
Monroe Calculating Machine Co., Div. of Litton Industries 7
Agency—L. H. Hartman Co., Inc.
Moore Business Forms, Inc. 17
Agency—N. W. Ayer & Son, Inc.

National Cash Register Co., The ..2nd Cover, 75
Agency—McCann-Erickson, Inc.
Nekoosa-Edwards Paper Co. 59, 60, 61, 62, 63, 64, 65, 66
Agency—The Cramer-Krasselt Co.
Nord Mfg. Co. 15
Agency—Jules Rabin Associates

Office Management 16, 87, 90
Office Management Association of Chicago .. 94
Agency—Foote, Cone & Belding

Paige Co., The 92
Agency—Davies, Mitchell & Voorhies, Inc.
Peerless Photo Products, Inc. 43
Agency—John Mather Lupton Co., Inc.
Photorapid Corp. 71
Agency—Wade Adv. Agency, Inc.
Photostat Corp. 45
Agency—The Rumrill Co., Inc.
Pitney-Bowes, Inc. 80, 81, 93
Agency—L. E. McGivena & Co., Inc.
Plus Computing Machines, Div., Control Systems, Inc. 88
Agency—George V. McIntyre Adv.

Remington Rand Div. of Sperry Rand Corp. 47
Agency—Paris & Peart Inc.
Roberts Numbering Machine Div., Heller Roberts Mfg. Corp. 99
Agency—George I. Bushfield
Roberts Rubber Co., Weldon 85
Agency—La Porte & Austin, Inc.
Ronald Press Co., The 89
Royal-McBee Corp. 79
Agency—Young & Rubicam, Inc.
Royal Typewriter Co., Div. of Royal-McBee Corp. 79
Agency—Young & Rubicam, Inc.

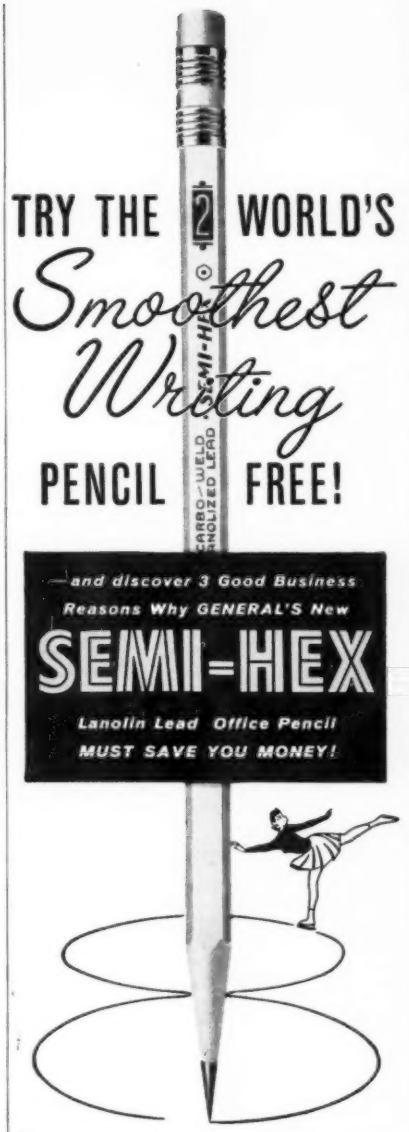
Smead Mfg. Co., The 78
Smith, Inc., Charles C. 93
Agency—Ayres, Swanson & Associates, Inc.
Smith-Corona, Inc. 4
Agency—Cunningham & Walsh, Inc.
Standard Packaging Corp., Eastern Fine Paper & Pulp Div. 73
Agency—Smith, Hagel & Knudsen, Inc.

Teletype Corp. 20
Agency — Marsteller, Rickard, Gebhardt & Reed, Inc.
Traveletter Corp. 84
Agency—Platt & O'Donnell, Inc.

Underwood Corp. ..... 3rd Cover
Agency—William Esty Co.

Visi-Shelf File, Inc. 97
Agency—Ritter, Sanford, Price & Chalek, Inc.
Vogel-Peterson Co. 85
Agency—Ross Llewellyn Adv.

Webster Co., F. S. 18, 19
Agency—Batten, Barton, Durstine & Osborn, Inc.
Workman Service, Inc. 99
Agency—Allan Marin & Assoc., Inc.



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editorial

Office building boom continues

THE boom in construction of office rental space in New York City, which broke all existing building records in 1958, will be accelerated this year. Buildings now going up will add an even greater amount of new office space in 1959; buildings already started which are scheduled for completion in 1960 and 1961 will insure that each of these years at least equals the 1959 record of new office construction.

Most of these buildings are speculative ventures—designed to attract corporate tenants. This means that real estate interests are betting very heavily on a continuing expansion of office functions, and a continuing concentration of those functions within the central city rather than in suburban areas.

All of these new buildings have been located in New York City's traditional business center—Manhattan Island. This at a time when the problems of the rail commuter lines feeding in people from the suburbs to New York are becoming daily more acute; those who foresee the eventual abandonment of the city by white collar workers daily more articulate.

New York's eventual resolution of the problem created by an ever-greater daily concentration of non-resident workers within a comparatively limited area could have tremendous significance for every other urban community in the country. For if the real estate interests in New York are right in their obvious belief that the central city will continue to be the natural location for most offices, it will mean that New York will have to find a solution to its commuter transportation problems, or else will have to draw an increasing number of its workers in the middle and upper-middle income brackets back to homes in the city. Either answer could have a profound effect on the whole future urban development of this country. If New York, girded by rivers, accessible only through bridges and tunnels, can continue to accommodate an ever-growing daily concentration of workers, other cities can do the same.

And—as of now—construction and real estate interests are investing in the future of New York rather than its suburbs.

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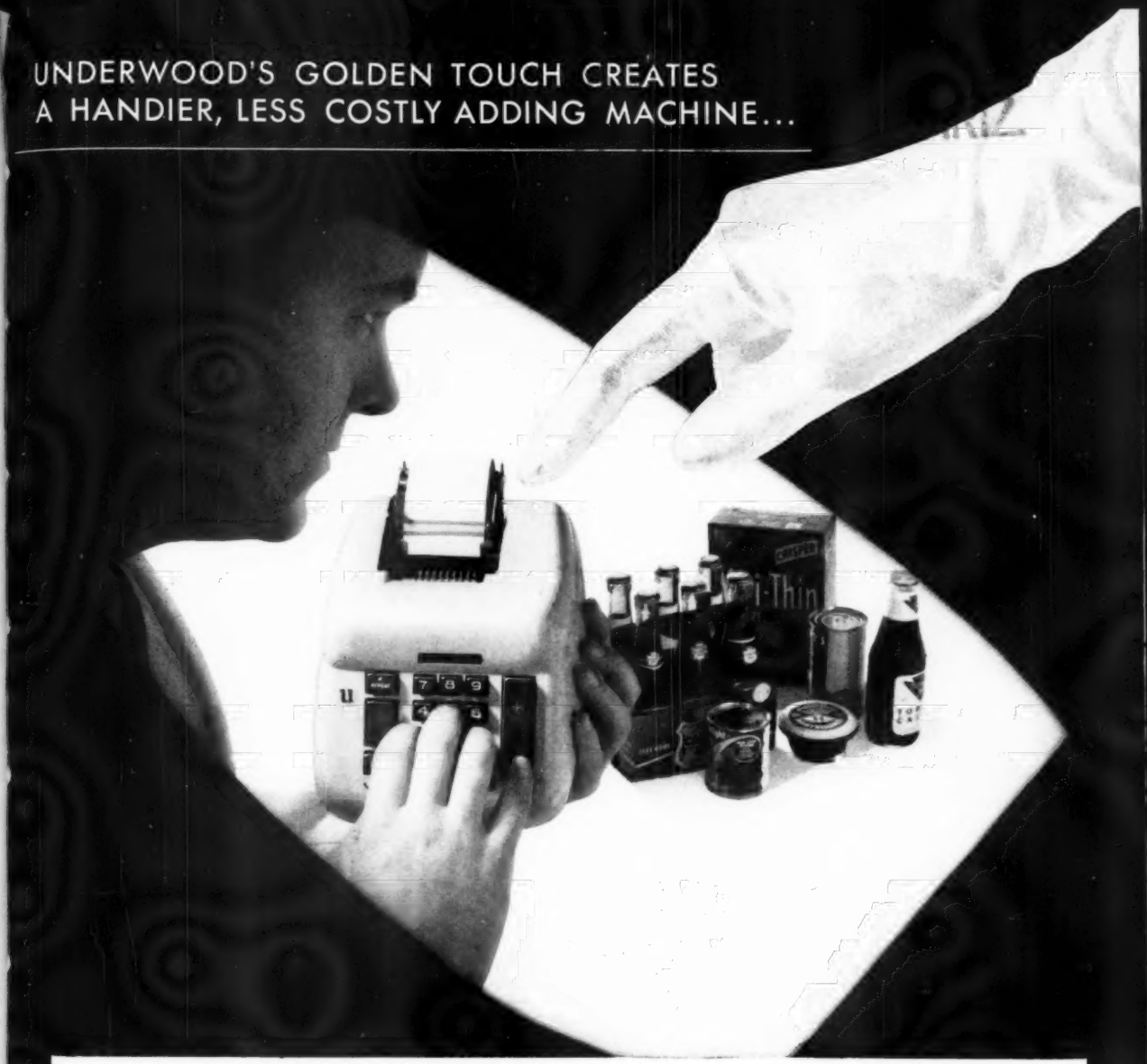

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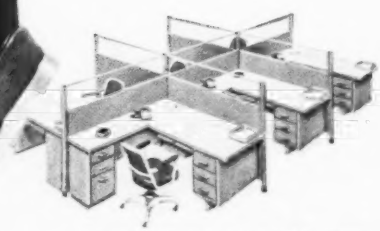

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